

# THE HILLSBOROUGH RIVER: An Ecosystem Study Unit

## Three Day Field Study at Nature's Classroom

Dear Teacher:

Welcome to the three day Hillsborough River Ecosystem Field Study Program at Nature's Classroom . Many changes have been made in the site and in the program to make this study a part of the total middle school learning experience.

Please use this packet to help prepare both yourself and your students for your trip to Nature's Classroom. We are all working hard to meet your needs.

Nature's Classroom Staff



## TEACHERS PRETRIP INFORMATION

The teachers and staff of Nature's Classroom are looking forward to working with you during your three-day field study. **To make this experience for your students as enjoyable as possible, please read the following information carefully.**

### **WHERE IS NATURE'S CLASSROOM?**

Nature's Classroom is located in Northeast Hillsborough County on 365 acres provided by the Southwest Florida Water Management District (SWFWMD). The acreage is located on the Hillsborough River and contains a variety of natural communities (i.e., riverine swamp, sandhills and pine flatwoods). The ecosystem study program at Nature's Classroom offers a variety of activities and learning experiences for all sixth grade public school children.

### **TEACHER AND CLASS PREPARATION**

**YOUR POSITIVE EXAMPLE AND ENTHUSIASM WILL GREATLY HELP YOUR STUDENTS.** Perhaps you have already been through the Nature's Classroom experience. Remember, this is your students' first time and your first time **WITH THESE PARTICULAR STUDENTS**. Your students will greatly benefit if they are prepared for their visit. Please use this curriculum guide to help prepare them before they arrive at Nature's Classroom.

### **PERMISSION SLIPS**

Regular field trip permission slips must be signed. These must have an emergency phone number. They must be kept on file at your school. Please bring a list of the students' emergency phone numbers with you.

### **NAME TAGS**

Each student must wear a name tag. Your bus driver will have masking tape and a marker should you need it.

### **GROUPING**

Your class will work in teams while at Nature's Classroom. The group size will vary for each activity. The students will be assigned to groups by the Nature's Classroom staff.

### **CHAPERONES**

Chaperones can play an important role in support and student management while your class is at Nature's Classroom. They are only required on the day your class goes out on the river in boats. You may choose to share chaperones between classes for the River Exploration - thus a chaperone may go out in the boats twice on the same day.

### **RESTROOMS**

It is your responsibility to take your class to and from the restrooms and to monitor their behavior during that time.

### **SEATING**

Your bus driver will show you the shelter and tables that are to be utilized by your class during your three-day visit. Each shelter has a storage container for lunches packed in paper bags.

### **DRESS**

Clothes should be appropriate for field trip activities. The clothing should be suitable for spending the day in the woods. Please be warned that mosquitoes may be active while you are at Nature's Classroom so you might want to bring repellent. In the winter, warm clothing is a necessity. The teacher should also dress for participating in outdoor activities. Proper comfortable shoes are a must for both teacher and student. Shoes such as sneakers are recommended. No thongs, sandals or other open-toed shoes are permitted. Students will need to wear old shoes on the day they sample aquatic organisms in the river. We have a supply of shoes on hand that your students may borrow on this day.

### **LUNCH**

Please contact your lunchroom manager to make arrangements for your students' lunches. One-half hour is the scheduled lunch period. Please adhere to this schedule as you will be changing activities after lunch. Please pick up your lunches at the designated lunch point. Please have your students pick up all trash around their area after lunch and before leaving at the end of the day. Place all trash in your trash bag and deposit it in the dumpster.

### **RULES**

The teacher is responsible for INSURING THAT DISCIPLINE IS MAINTAINED on the bus and at Nature's Classroom, and that students follow all instructions given by the Nature's Classroom teachers. As Nature's Classroom is a Hillsborough County School all school regulations will apply. Please remind your students that they

are not to bring knives, toys, radios, gum, candy, or matches to Nature's Classroom. It is to be stressed that all of the activities and experiences at Nature's Classroom are LEARNING ACTIVITIES.

**NATURE'S CLASSROOM MANNERS** (Review with class before arrival)

- Be gentle and quiet - noise frightens wildlife into hiding.
- Be kind to plants - they need their leaves to make food and their flowers to make seeds. Please do not pick or pluck them - leave them for others to enjoy!
- Be kind to animals - chasing, teasing or pestering them makes them timid. Let's just watch them and learn how they live and try hard not to frighten them.
- Stay on the trails - for your comfort and safety and because we don't want to trample small plants, animals and delicate soil communities.
- Keep up with the group - you have such a short time at Nature's Classroom - don't waste it by dragging behind and making everyone wait for you.
- Be kind and courteous to each other - help make the three days at Nature's Classroom pleasant for all.

NO NOISE OR LOUD PLAY IN THE SHELTER AREA PLEASE....AND REMEMBER....DON'T BE A LITTER-BUG.

**TEACHER RESPONSIBILITIES**

- Please have your class ready to leave school as soon as possible each morning.
- Please know the rules of Nature's Classroom and actively support enforcement of these rules.
- Facilitate and monitor your students' investigations.
- Please assist the Nature's Classroom teachers with their activities.
- Take responsibility for the general welfare and maintenance of discipline of your class.
- Be sure the students are dressed appropriately for the weather.
- Stay with your class.
- Bring emergency phone numbers with you
- Send home parent information sheet supplied by your school.

- If you have any questions regarding your Nature's Classroom experience please don't hesitate to call (987-6969).

**TRANSPORTATION**

The Hillsborough County School Board provides Nature's Classroom with special school buses and bus drivers who receive specialized training to serve a dual capacity. They drive the buses to Nature's Classroom and then become boat operators. There is a \$9 transportation charge per child for the transportation but the children and their teachers experience Nature's Classroom at no additional costs. Students who can not afford the fee are not to be left at school. A list of these students should be sent to Nature's Classroom along with the transportation check following your field experience.

**PROGRAM ACTIVITIES**

During the three-day field study all classes will participate in the following activities:

1. **Birds of Prey, Mammals & Reptiles Investigations** - Aviary/Animal Compounds
2. **Upland & Wetland Investigation** Trails and Boardwalk
3. **River Exploration & Boating Safety** - Boats
4. **Adaptations of Aquatic Organisms** - Riverfront dipping
5. **Adaptation of Organisms** - Interpretative Center
6. **Upland Orienteering** - Upland compass area

## Student Outcomes

### *Conceptual*

1, 3, 4, 6

### *Affective*

1, 4

### *Process*

1, 2, 3, 5

### Safety

Wear life jackets at all times.

Remain seated in the boat except as directed by a NC Boat Operator.

Keeps hands inside the boat.

Be careful with water test materials.

Use caution when entering and leaving the boats.

## Teacher Notes



## RIVER EXPLORATION & BOATING SAFETY

### INTRODUCTION

The health of the Hillsborough River is important to all the citizens of Hillsborough County. During this activity, students will be given instruction on safe boating. They will then journey down the river to Trout Creek Park. During this trip, they will observe and identify wildlife in order to monitor the health of the river.

### FIELD ACTIVITIES

Students will work in teams under the direction of the boat operators. The school will need to provide additional adult chaperones in the ratio of one adult per nine students. Each team of students will monitor a different parameter of the river's quality. Teams will include:

- riverine reptile monitors;
- riverine bird monitors;

Students will demonstrate an understanding that:

1. A healthy ecosystem is made up of a diverse group of populations interacting with each other and their physical environment.
2. Organisms have special adaptations that allow them to make a successful living in and along the Hillsborough River.
3. A healthy river system will have a high biodiversity.
4. Within The Hillsborough River ecosystem, energy has to be constantly renewed but matter is recycled.
5. Water chemistry tests can be used to help determine the health of the river.

6. The Hillsborough River is an important resource for all citizens of Hillsborough County and it is used in a variety of ways.
7. Historically, human activities have had a negative impact upon the Hillsborough River.
8. Each of us has a role in preserving and protecting the Hillsborough River ecosystem.

Students will demonstrate skill in:

1. Carrying out water chemistry investigations.
2. Accurately record information about birds found along the river.
3. Developing reasonable conclusions from observations and investigations.

Each team will complete their individual data collection assignments and then they will pool their data. A collective data sheet will be compiled by the boat operator.

Primary Instructor(s) -Nature's Classroom Boat Operator

Role of Classroom Teacher - Monitor student behavior on your boat. Assist students with water testing and wildlife observation. Facilitate recording data. **Collect data sheets after the students have recorded the Nature's Classroom dock data.**

Role of Chaperone(s) - Monitor student behavior on your boat. Assist students with water testing and wildlife observation. Facilitate recording data.

Materials Needed - Data sheets, and water test materials are all on board the boats.

#### PREVISIT ACTIVITIES

1. Discuss the River fact sheets. Ask students to list some abiotic factors which might affect organisms which live in rivers.
2. Discuss the affects of DO, pH, and nutrient levels on aquatic organisms.
3. Review the concept of Biodiversity.
3. View the first part of the Video - "The Treasures of the Hillsborough River".

#### POST ACTIVITIES

1. Complete the Field Study Followup - What does it all mean?
2. Complete the language arts and mathematical activities on the Hillsborough River.
3. Have students do a water audit of their home water use and relate this to the Hillsborough River.

#### RESOURCES

VHS

**The Treasures of the Hillsborough River - School Media Center**  
**" I Am The River" - District Media Center**

## Student Outcomes

### **Conceptual**

1, 3, 6

### **Affective**

3, 4

### **Process**

1, 2, 3, 5



### **SAFETY**

Stand 4 feet back from cages.

Remain behind the safety barriers where present.

No hands on cages.

Walk, don't run, from cage to cage.

Do not feed or tease the animals.

Stay with the group.

Refrain from loud noise and fast movements.

## **AVIARY AND ANIMAL COMPOUNDS INVESTIGATIONS**

### **INTRODUCTION**

The aviary and animal compounds at Nature's Classroom are the homes for a variety of native animals. Most of these animals have either been injured or were taken in as babies as pets and dumped when they began to exhibit adult behavior. As a result, release back into the wild is not an option.

### **FIELD STUDY ACTIVITIES**

These investigations will enable your students to learn about adaptations in the various species of large animals found within the Hillsborough River Watershed.

Investigations will center on three groups of animals: Mammals; Reptiles; and Birds of Prey.

Students will demonstrate an understanding that:

1. Organisms have special adaptations that allow them to make a successful living in and along the Hillsborough River.
2. A healthy ecosystem is made up of a diverse group of populations interacting with each other and their physical environment.
3. Some organisms are in trouble or have been eliminated from the watershed due to their interactions with humans.
4. Certain animals have physical or emotional disabilities which make them unable to survive in the wild.

Students will demonstrate a skill in:

1. Using observation and inference skills to synthesize information on how various adaptations make mammals reptiles and birds of prey successful in surviving within the Hillsborough River Watershed.

Primary Instructor(s) -Nature's Classroom Instructor

## Teacher Notes

Role of Classroom Teacher - Escort students to each of the aviary and the animal compounds. Monitor student behavior to insure that they stay behind the barriers and keep their hands out of the cages. Assist students with making observations. .

Role of Chaperone(s) - Monitor student behavior to insure that they stay behind the barriers and keep their hands out of the cages. Assist students with making observations.

#### **PREVISIT ACTIVITIES**

1. **Review safety rules with your students.**
2. **Do a KWL activity with your students on large animals of the Hillsborough River Watershed.**

#### **POST ACTIVITIES**

1. **Complete the KWL activity.**

## Student Outcomes

### Conceptual

1, 2, 3, 4, 5

### Affective

1, 3, 4

### Process

1, 2, 3

## SAFETY

Follow rules given by the classroom teacher.

Stay on the trail and boardwalk.

Watch out for snakes.

Be careful of poison ivy.

Walk, don't run .

Refrain from loud noise and fast movements.

## Teacher Notes

The teacher should be the last one in line. The teacher should encourage students to be quiet when it's time to be quiet.

We have found that if the visiting teacher is interested and asks some good questions, it encourages students to do likewise.



## UPLAND & WETLAND INVESTIGATION

### INTRODUCTION

The abiotic factors within the environment dictate what biological communities can live in what habitats. During their investigation, the students will move from high, dry uplands through a hydric hammock and into the riverine swamp.

This journey will allow the students to observe how changes in light, elevation and soil type affect soil moisture and plant communities. They will also observe the role of fire in biological communities. As the students enter the river flood plain they will observe how changes in the river's level shape the biological communities found in this environment.

### FIELD STUDY ACTIVITIES

Under the direction of their Nature's Classroom Instructor the students will explore the trails and boardwalk. During this activity they will:

- see that there is a pattern to the distribution of plants and animals that live in the river, floodplain, and the uplands.
- learn that this pattern is determined by a variety of abiotic (non-living) factors in the environment.
- observe examples of the interdependence of living things.
- use of their five senses to observe nature.
- identify many different kinds of plants and their communities.
- become aware of the importance of the Hillsborough River and how it is affected by both nature and humans.
- see the effect of the rise and fall of the water level on the plant communities within the flood plain.

Primary Instructor - Nature's Classroom Instructor

## **FIELD STUDY ACTIVITIES CONT.**

Role of the Classroom Teacher - Assist students in making observations. Ask clarifying questions. Refer students to interpretive signs to locate key information. Monitor student behavior to insure they stay on the trail and boardwalk.

Role of the Chaperone(s) - Monitor student behavior to insure they stay on the trail and boardwalk. Follow the group to prevent straggling. Assist students with making observations.

## **PREVISIT ACTIVITIES**

1. Review Ecosystem Fact Sheets with your students.

## **POST ACTIVITIES**

1. Discuss the interaction of the abiotic factors (soil type, the amount of organic material in the soil, the ability of the soil to hold moisture, frequency of fire, the amount of light, flooding and moving water) with the plants and animals in these communities.
2. Have the students work in groups to complete the Ecological Community Comparison Charts in the Student Activities section of your curriculum guide.

## Student Outcomes

### **Conceptual**

1, 2, 3, 4, 5

### **Affective**

1, 3, 4

### **Process**

1, 2, 3

### SAFETY

Follow rules given by Nature's Classroom teacher.

Do not wander out into deep water.

Use caution in handling specimens.

Refrain from loud noise and fast movements.

Avoid horseplay in the river

## Teacher Notes



## ADAPTATION OF AQUATIC ORGANISMS: Shore-line Sampling

### INTRODUCTION

During this activity the students will engage in the collection of aquatic specimens from the Hillsborough River. Working in groups of four (4) they will capture organisms with dip nets. Their samples will include vertebrates such as fishes and amphibians and invertebrates such as insects, crustaceans, and mollusks.

### FIELD STUDY ACTIVITIES

A Nature's Classroom Teacher will work with you and your students during this activity. You will need to assist your students in identifying and classifying the organisms that they catch. In this activity the class will receive:

- safety instructions for dipping.
- instructions on the proper handling of nets and the best techniques for catching aquatic life.
- instructions on safe handling and retrieving of specimens in the net.
- instructions for identifying and classifying most specimens caught.
- the opportunity to succeed.

Primary Instructor(s) - Classroom Teacher

## **FIELD STUDY ACTIVITIES CONT.**

Role of Classroom Teacher - Assist students in making observations. Ask clarifying questions. Refer students to interpretive signs to locate key information. Monitor student behavior to make they stay in shallow water the collection area.

Role of Chaperone(s) -Monitor student behavior to make they stay in shallow water the collection area. Assist students with making observations.

Materials Needed - Aquatic Animal Data Sheets (distributed by N.C. Staff on site).

## **PREVISIT ACTIVITIES**

1. Review River Organisms Fact Sheets with your students.

## **POST ACTIVITIES**

1. Complete Streamwatch Data Sheet. Discuss the importance of this data with your students

## Student Outcomes

### **Conceptual**

1, 2, 3, 4, 5

### **Affective**

1, 3, 4

### **Process**

1, 2, 3

## SAFETY

Positively no horseplay!!

Do not tease animals, classmates or teachers.

Do not pet animals on head or put your hands near the animals' mouths.

Move at a slow to normal walk (do not run).

Do not hand a live animal to anyone.

## Teacher Notes



## INTERPRETATIVE CENTER OF NATURAL SCIENCE

### INTRODUCTION

The Interpretative Center gives the students and the classroom teacher "hands on experiences" of various live and preserved specimens. They come face to face with a variety of fish, amphibians, reptiles, birds and mammals. The process allows both students and teachers to feel more comfortable and confident in any outdoor situation involving wildlife.

### FIELD STUDY ACTIVITIES

In the Interpretative Center your student investigative teams will carry out a hands-on study of a variety of live and preserved organisms. During a part of the time they are in the center, the class will be seated for a question and answer session conducted by the Nature's Classroom Instructor. The students will:

- be introduced to identification of native and exotic wildlife.
- classify vertebrates into the five major classes.
- identify the characteristics of the major vertebrate classes found in the Hillsborough River Watershed.
- handle live specimens.
- develop a better attitude toward wildlife and its place in our world.
- increase curiosity so that they will make further investigations into wildlife on their own.
- distinguish between cold-blooded and warm-blooded animals.

Primary Instructor(s) - Nature's Classroom Wildlife Instructor.

Role of Classroom Teacher - Escort students to the seating area in the Interpretive Center. Monitor student behavior to insure that they are careful in handling both artifacts and animals. Assist students with making observations. Ask students clarifying questions.

Role of Chaperone(s) - Monitor student behavior. Assist students with making observations.

### **PREVISIT ACTIVITIES**

1. Discuss with your students that they will be visiting the interpretative center where they will be given the opportunity to interact with a variety of live organisms. Go over the safety rules.

### **POST ACTIVITIES**

1. Discuss their experiences with your students.

## Student Outcomes

### **Conceptual**

1, 2, 3, 4, 5

### **Affective**

1, 3, 4

### **Process**

1, 2, 3

### SAFETY

Follow rules given by the Nature's Classroom teacher.

Stay with the group.

Watch out for snakes.

Be careful of poison ivy.

Walk, don't run.

Refrain from loud noise.

## Teacher Notes



## ORIENTEERING

### INTRODUCTION

This exploration of the upland communities found at Nature's Classroom will give the students an opportunity to use a compass and chart to investigate upland communities at Nature's Classroom.

### FIELD STUDY ACTIVITIES

The upland exploration is lead by a Nature's Classroom teacher. The students will hike to a compass orienteering area. They will work in teams to navigate their way through at least two upland communities. During their investigation the students will:

- observe the adaptations of plants and animals to a variety of environmental conditions.
- learn to work as a team to solve real life problems.
- develop skills in the use of a compass.
- increas their curiosity and confidence so that they will make further explorations into natural environments with their family.

Primary Instructor(s) - Nature's Classroom Teacher

Role of Classroom Teacher - Monitor student behavior to insure that they are careful and stay with the group. Assist students with using the compass. Ask students clarifying questions.

Role of Chaperone(s) - Monitor student behavior. Assist students with making observations.

Materials Needed - Compass and trail charts are furnished by Nature's classroom

# NATURE'S CLASSROOM

## MANNERS

- Be gentle and quiet - noise frightens wildlife into hiding.
- Be kind to plants - they need their leaves to make food and their flowers to make seeds. Please do not pick or pluck them - leave them for others to enjoy!
- Be kind to animals - chasing, teasing or pestering them makes them timid. Let's just watch them and learn how they live and try hard not to frighten them.
- Stay on the trails - for your comfort and safety and because we don't want to trample small plants, animals and delicate soil communities.
- Keep up with the group - you have such a short time at Nature's Classroom - don't waste it by dragging behind and making everyone wait for you.
- Walk - don't run. You may injure yourself or others.
- Be kind and courteous to each other - help make the three days at Nature's Classroom pleasant for all.

NO NOISE OR LOUD PLAY IN THE SHELTER AREA PLEASE .... AND REMEMBER .... DON'T BE A LITTERBUG.

# ENRICHMENT AND ENHANCEMENT ACTIVITIES

## River Exploration

### PREVISIT ACTIVITIES

1. Review the concept of aquatic environments. Ask students to list some abiotic factors which might affect organisms which live in rivers.
2. Discuss the affects of DO, pH, and nutrient levels on aquatic organisms.
3. Review the concept of Biodiversity.
3. View the first part of the Video - "The Treasures of the Hillsborough River".

### POST ACTIVITIES

1. The students can have open class discussions on:
  - a. how the river changes with the seasons.
  - b. why biological diversity is an important indicator of the health of a river.
  - c. the interdependence of living things.
  - d. human use of the river, past, present and future.
2. Complete the language arts and mathematical activities on the Hillsborough River.
3. Have students do a water audit of their home water use and relate this to the Hillsborough River.

## Animal compound

### PREVISIT ACTIVITIES

1. Review students on the concept of adaptations. Have them list some of the characteristics of reptiles, birds, and mammals. Review the concept that in order to survive, animals need food, water, and shelter. Students should determine how they will work in groups to record information on specific animals of the Hillsborough River ecosystem.
2. Have the students review the concepts of wild, tame, domestic and pets. Have them also review the concept of exotic species and their effect on native wildlife.
3. Introduce the students to the idea that due to human influence, especially the destruction of habitat, many organisms of the Hillsborough River ecosystem are in trouble. Discuss the meaning of the terms; Species of Special Concern, Threatened Species, and Endangered Species. Have them research some Florida animals in these categories. During their visit to Nature's Classroom, they should collect data via Field Notebooks and photographs. Back in class they can compile reports from their data.

### POST VISIT ACTIVITIES

1. The students can have open class discussions on:
  - a. why protecting our wildlife is important.
  - b. the definition of conservation and examples of the wise use of our natural resources.
  - c. the interdependence of living things.
  - d. the necessity of living in harmony with our environment.
  - e. how are predator and prey species adapted for their roles within the watershed.
2. Complete their reports on animals seen at Nature's Classroom.
3. Write a story about how it feels to be a deer, a raccoon, an eagle, a snake, an alligator, etc.
4. Build bird feeders and observe bird behavior at the feeder. Collect and display (perhaps as a mobile) the feathers you find near the bird feeder.
5. Have students do a mural of animals seen in the compound in their natural habitats.

## HIKE

### PREVISIT ACTIVITIES

1. Ask the students, "What is an Ecosystem?" Record their responses on the board or on chart paper.
2. Put the students into groups. Ask them in groups to brainstorm and list as many characteristics as they can of a dry upland community and a wetland community. Have them then group these ideas as biotic or abiotic factors. Tell them that they will refine this list after their visit to Nature's Classroom.
3. Have the students individually write a paragraph on their feelings about walking through a swamp.

## AQUATIC SAMPLING

### PREVISIT ACTIVITIES

1. Review the concept of adaptation with the class. Ask them in groups to list characteristics which all aquatic organisms share.
2. Prior to their dipping activity the class will list on the blackboard specimens they expect to see or catch - compare afterwards.
3. Discuss kinds of insects you see in and around water.
4. Assign each group the task of doing a detailed description of one of the aquatic animals collected during the dipping activity at Nature's Classroom.

### POST VISIT ACTIVITIES

1. Check off the specimens seen or caught that you listed on the blackboard (refer to Nature's Classroom dipping checklist).
2. Discuss the life cycles and feeding habits of some of the specimens caught.
3. Each group should prepare a report on their selected organism.
4. Collect specimens in bodies of water near your school: ditches, ponds, etc., and identify them.