



Biscayne National Park

Underwater Ecosystem Adventure

- **Target Audience:** For students in grades 6th-8th.
- **Subject Area:** Life sciences.
- **Duration:** The E-Field Trip takes approximately 20 minutes. The *E-Field Trip Review* takes an additional 30 minutes.
- **Location:** Classroom.
- **Group Size:** Any.
- **Key Vocabulary:** Ecosystem, biodiversity, exoskeleton, estuary, habitat, renewable/non-renewable resources.
- **Standards Met:**
SC.G.1.3.5
SC.G.2.3.1
SC.G.2.3.2
SC.G.2.3.3

Overview

In this electronic version of a field trip through Biscayne National Park, students discover the four ecosystems that make the park unique and very important. They interact with the virtual plants, animals, and even people in these ecosystems through the computer to learn important facts and special characteristics.

To enhance the students' understanding of the park and the natural resources around them, the *E-Field Trip Review* (comprised of multiple choice, true/false, and critical thinking questions) should be completed in conjunction with this field trip.

Completing one or more of the "extensions" listed at the end of this lesson plan will also greatly add to the students' comprehension and encourage them to contribute to their community, while showing them the significant connection they have to all they learned about Biscayne National Park.

Goals

1) Students will gain an appreciation for the ecosystems of Biscayne National Park and understand how they are connected to each other.

2) Students will understand their role in these ecosystems and the environment around them; that human "activities may deliberately or inadvertently alter the balance in an ecosystem".

3) The science standards met in the classroom will be reinforced, such as understanding that abiotic and biotic factors are interrelated and if one changes this can impact other resources.

Objectives

Upon completing this activity, students will be able to:

- 1) Identify the four ecosystems of Biscayne National Park.
- 2) Describe what a coral is and the diversity of life coral reefs support.
- 3) Name at least two ways mangrove trees contribute to other organisms in their ecosystem.
- 4) Explain a way in which at least two of the park's ecosystems affect one another.
- 5) Name two ways humans are affecting the natural systems in and around Biscayne National Park.
- 6) State three actions they can take to help preserve the ecosystems and their natural environment.

Background

Biscayne National Park is the largest marine park in the National Park System. National Parks are protected areas throughout the country that belong to the public and which preserve unique cultural history or natural resources. Biscayne is unique because it hosts four very important ecosystems.

The park is relatively new, having been protected as a National Monument in 1968 and established as a National Park in 1980. Because of the high property value and desire for human use in this area, those who wanted a park had to fight for it. Though they won and the park's natural resources are maintained, Biscayne is still under immense pressure from outside forces such as a sprawling city and marine pollution. Park Rangers work everyday to continue to preserve these fragile resources for us and future generations.

Materials

Computer with internet access, print out or electronic version of the *E-Field Trip Review* (optional).

Methods/Procedures

1. Load the page: <http://www.nps.gov/bisc/forteachers/distancelearningopportunities.htm>
2. Click on the box in the center picture: "click here to begin your virtual visit".
3. Follow the Ranger on your field trip by following the directions on each screen and clicking where it tells you to.
4. The *E-Field Trip Review* can be completed simultaneously as the students take the trip, or after they have completed their underwater journey.

Extensions

Students can complete one or many of these projects, either individually or in a group. They are made to be appealing to a variety of learning styles and creative abilities.

I. **Preservation Proclamations** - Have each student design a "billboard" promoting and advertising the preservation and protection of coral reefs. On an 8 ½ x 11 sheet of paper (with marker, paints, etc.), the students should create a message and/or image that describes the need to care for coral reefs worldwide.

An example of a billboard supporting coral reef conservation



II. **Clean-up!** - Participate in a local marine debris or river clean-up. These can be found on county Parks and Recreation web-sites or within local activity calendars (in south Florida there is a large scale clean-up of Biscayne Bay every April called "Baynanza"). It is important to keep waterways clean of trash and other debris because they can be carried into the water and harm organisms in the ecosystem or pollutants can leach into the ground also contaminating our water supply. This can be a fun way to contribute to the students' community while giving back to the environment.



A group of students participating in Baynanza at Biscayne National Park

III. Waste not, want not - The students will first complete a worksheet to track and calculate how much water they use in one weekend (see attached page). This should make it clear to them the need to conserve freshwater. One way to do this is to use rain barrels in gardens and around homes or other buildings. A rain barrel is a container that collects rain water from rooftops (stormwater runoff); during an average rainstorm more than 700 gallons of water runs off the roof of just one home-that's enough to take 17 baths or 58 showers! Students can construct a rain barrel for school or at home and can even decorate it and post informative signs around it.



Obtaining the supplies for and putting together a rain barrel is not difficult. To find step-by-step instructions or suggestions and helpful hints, go to web-sites such as: http://www.cbf.org/site/DocServer/rain_barrel_guide-web.pdf?docID=2868 or your local water management web-site (often they will sell the supplies and offer permits).

IV. Native Ways - Plant native trees or a flower garden around the school, community, or at home. Landscaping reduces stormwater runoff by blocking debris from entering waterways, filtering the water and soil, and stabilizing the ground to prevent erosion. To find out more tips about “rain gardens”, like to how use mulch or gravel, log on to sites such as: http://www.enature.com/native_invasive/ and <http://www.mninter.net/~stack/rain/>.

Remember to plant native species to support the natural ecosystem in your area; your local garden supply store or nursery can help you choose the correct plants.

Florida Sunshine State Standards

Science

Grades 6-8

Benchmark SC.G.1.3.5

The student knows that life is maintained by a continuous input of energy from the sun and by the recycling of the atoms that make up the molecules of living organisms.

Benchmark SC.G.2.3.1

The student knows that some resources are renewable and others are non-renewable.

Benchmark SC.G.2.3.2

The student knows that all biotic and abiotic factors are interrelated and that if one factor is changed or removed, it impacts the availability of other resources within the system.

Benchmark SC.G.2.3.3

The student knows that a brief change in the limited resources of an ecosystem may alter the size of a population or the average size of individual organisms and that long-term change may result in the elimination of animal and plant populations inhabiting the Earth.

Name _____

Date _____

How much water do you use?

Use the chart below to track your daily water use over two days (a weekend). Put a check in the second column each time you do a listed activity. Calculate each activity's total water use by multiplying the number of checks by the number in the third column.

Activity	Number of Times Over 2 Days	Amount of Water (Gallons)	Total Amount of Water Used (Gallons)
Washing hands		0.5	
Taking a shower (number of minutes*)	*	5 gallons per minute	
Taking a bath		40	
Flushing a toilet		5	
Brushing your teeth (water running)		1	
Brushing your teeth (water off)		0.25	
Food and drink		0.5 per day	
Total ----->			

How much water did you use over the weekend?

Did you know...

- Even though our planet is mostly made up of water, less than 1% of it is freshwater.
- Nearly half of the people in the world (2.6 billion) DO NOT have easy access to freshwater.
- On average, a person in the U.S. uses 100 gallons of water per day.