| **Indiana Dunes**  **Education** | National Park Service  U.S. Department of the Interior  **Indiana Dunes National Lakeshore**  **Education Department** | National Park Service Logo |
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**Water World**

**Summary:**

Come ready to experience and explore the diversity of life within and around a wetland. Investigate the rich diversity of an interdunal pond. Hike through dune and swale to examine the pond’s surrounding ecosystem of plants and animals.

Learn how the national lakeshore helps preserve these valuable resources and ways you can help too.

**Objectives:** students will be able to

1. name plants and animals that live in and depend on wetland habitats.
2. list ways Miller Woods affects and is affected by the wetland habitats within Miller Woods.
3. construct a food web using organisms found in and around a wetland..
4. describe how he or she could make lifestyle changes to save and keep clean water.
5. explain how the national park helps protect wetlands.



**What to expect on during your trip:**

Group is greeted at the facility. Hikes can begin inside but most of program is outdoors.

The park, the ranger and the theme for the program are introduced.

Various props and activities are brought out and a hike down to the wetland begins.

**Setting:**

The This 1-2 hour program takes place at the Douglas Center and the surrounding Miller Woods. The program hikes through an oak savanna to the various wetlands scattered throughout the dunes

**Grade:**

Geared for 4th -12th

**Ratio of students to ranger:**

There is a maximum of 16 students per ranger unless staffing is limited; then the groups will be larger with the teachers having to help lead.

**Safety Issues:**

Comfortable old walking shoes are needed. Dress for weather. If hot, bring water and bug spray.

**Background Information:**

Protection of our natural aquatic environments in the national lakeshore and the impact surrounding industry has on the park’s aquatic resources is one of the key resource management issues facing the lakeshore.

The high diversity ranking of the national lakeshore within the park system is due to the wetland habitats it encompasses.

Exploration and discovery of this type of habitat is needed in today’s world where we often bypass the fundamentals of the food chain or the smaller creatures and invertebrates of the natural world.

With environmental pressures such as purple loosestrife and phragmites encroaching on these fragile habitats, future stewards are needed to be shown and taught to know and to care for this environment.

**Prerequisite Classroom Activities:**

Before Taboo Game – Based on the popular game, Taboo, make cards about pond life. The students can play it in class after their field trip.

Making water samples – Using water testing kits students can test samples of water from creeks, streams, ponds or lakes around their school.

Making pond surveys – Students can do studies of creeks or ponds, See if pollution, farm runoff, or other factors affect the kinds of organisms they find. Compare their results to a pond protected at INDU.

Create a wetlands mural in class – This could be done before and after the field trip. Suggest they begin with a wetland base then visit Miller Woods and draw pictures or take pictures and bring those back to add to the mural based on what they find on the field trip.

**Vocabulary:**

Community- an interacting population of various kinds of individuals (as species) in a common location

Food Chain- an arrangement of the organisms of an ecological community according to the order of predation in which each uses the next usually lower member as a food source

Explore- to search through / to go into or travel over for purposes of discovery or adventure / to examine carefully and in detail especially in order to make a diagnosis

Adaptation- adjustment to environmental conditions: as an adjustment of a sense organ to the degree or quality of stimulation / change in an organism or its parts that fits it better for the conditions of its environment / a structure resulting from this change

Habitat- the place or type of place where a plant or animal naturally or normally lives or grows

Metamorphosis- typically marked and more or less abrupt developmental change in the form or structure of an animal (as a butterfly or a frog) occurring subsequent to birth or hatching

**Illinois Content Standards:**

The Water World The following is a list of the learning standards which the Water World program at Indiana Dunes National Lakeshore will assist you in fulfilling. Please realize that every program is unique, based on the students’ abilities, weather factors and time, and not all of these standards may be articulated. This listing is meant as a guideline for you as an educator. You may want to conduct activities in your classroom to strengthen certain goals and standards, and our program may only briefly cover certain elements of the standards. There are many other curriculum standards which this program could also assist you in fulfilling, however, these identified provide the most obvious links between our program and your curriculum objectives. If you have any questions about these correlations, please contact the park’s education specialist.

**SCIENCE**

State Goal 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.

Standard A: Know and apply the concepts, principles and processes of scientific inquiry.

Late Elementary

11.A.2b Collect data for investigations using scientific process skills including observing, estimating and measuring.

11.A.2c Construct charts and visualizations to display data.

11.A.2e Report and display the results of individual and group investigations.

Middle School

11.A.3f Interpret and represent results of analysis to produce findings.

11.A.3g Report and display the process and results of a scientific investigation.

Early High School

11.A.4f Using available technology, report display and defend to an audience conclusions drawn from investigations.

State Goal 12: Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.

Standard A: Know and apply concepts that explain how living things function, adapt and change.

Late Elementary

12.A.2a Describe simple life cycles of plants and animals and the similarities and differences in their offspring.

Standard B: Know and apply concepts that describe how living things interact with each other and with their environment.

Late Elementary

12.B.2a Describe relationships among various organisms in their environments (e.g. predator/prey, parasite/host, food chains and food webs).

12.B.2b Identify physical features of plants and animals that help them live in different environments (e.g. specialized teeth for eating certain foods, thorns for protection, insulation for cold temperature).

Middle School

12.B.3a Identify and classify biotic and abiotic factors in an environment that affect population density, habitat and placement of organisms in an energy pyramid.

12.B.3b Compare and assess features of organisms for their adaptive, competitive and survival potential (e.g. appendages, reproductive rate, camouflage, defensive structures).

Early High School

12.B.4a Compare physical, ecological and behavioral factors that influence interactions and interdependence of organisms.

12.B.4b Simulate and analyze factors that influence the size and stability of populations within ecosystems (e.g. birth rate, death rate, predation, migration patterns).

Late High School

12.B.5a Analyze and explain biodiversity issues and the causes and effects of extinction.

12.B.5b Compare and predict how life forms can adapt to changes in the environment by applying concepts of change and constancy (e.g. variations within a population increase the likelihood of survival under new conditions).

State Goal 13: Understand the relationships among science, technology and society in historical and contemporary contexts.

Standard B: Know and apply concepts that describe the interaction between science, technology and society.

Late Elementary

13.B.2f Analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems (e.g. lawn and garden care, mass transit).

Middle School

13.B.3d Analyze the interaction of resource acquisition, technological development and ecosystem impact (e.g. diamond, coal or gold mining; deforestation).

13.B.3e Identify advantages and disadvantages of natural resource conservation and management programs.

Early High School

13.B.4d Analyze local examples of resource use, technology use or conservation program; document findings; and make recommendations for improvements.

**Extension or Follow-up Activity**

Class reflection paper or writing sample:

Ask each student to write a short essay, letter or story about what they learned on their field trip to Indiana Dunes National Lakeshore. Rangers love receiving mail from their students. Send the ranger the packet of essays from your class (or a copy of them), and your ranger will send your class a certificate from the dunes. Send your essays to:

Indiana Dunes National Lakeshore

1100 N. Mineral Springs Road

Porter, IN 46304

Attn: Your ranger’s name or just Education Department

If you are using this essay as a class assignment for a grade, we would like to suggest that each essay contain the following elements. Use the rubric below to score them.

\* The name of the park and the location of their field trip—for example: Douglas Center, Indiana Dunes National Lakeshore

\* Three facts they learned on the field trip about the habitats of the dunes.

\* A brief explanation of why Indiana Dunes is unique and therefore a national park.

\* At least two things the student can do to help take care of his or her national park.

\* Fill in the blank of this statement and provide an explanation:

I would like to learn more about \_\_\_\_\_\_\_\_\_\_ at Indiana Dunes.

\*\*\* For advanced groups, add the following element:

Tell the park rangers if you would like to bring your families and friends to the dunes and if so what would you do here and where would you go.

**Assessment:**

**Grading Scale for Class reflection writing assignment:**

1. **Writing and organization**- ***4 points*** the writing sample is very well written and organized by the elements provided. It has a strong introduction, middle and conclusion. ***3 points*** the writing sample is well written and organized by the elements provided. It includes an introduction, middle and conclusion. ***2 points*** the writing sample is choppy and is not well organized. It lacks an introduction or conclusion. ***1 point***the writing sample is very short and unorganized.
2. **Grammar & Spelling-** ***4 points*** Mistakes in spelling and grammar are minor or non-existent. ***3 points*** Mistakes in spelling and grammar are minimal—about 4-5. ***2 points*** mistakes in spelling and grammar are numerous—5-10. ***1 point*** mistakes in spelling and grammar are more than 10.
3. **Facts and content**- ***4 points*** the writing sample demonstrates the student’s learning on the dunes program and includes three or more facts provided by the park staff. ***3 points*** the writing sample demonstrates the student’s learning and includes only two facts provided by the park staff. ***2 points*** the writing sample does not demonstrate much learning and only includes one fact provided by the park staff.***1 point*** the writing sample does not demonstrate any learning and does not include any facts provided by the park staff.
4. **National Park Service theme** - ***4 points*** the writing sample clearly demonstrates the student’s understanding of the role of the NPS in preserving the dunes by explaining why Indiana Dunes is such a unique treasure.***3 points*** the writing sample mentions the NPS and its role in preserving the Indiana Dunes. ***2 points*** the writing sample mentions the NPS and Indiana Dunes. ***1 point*** the writing sample does not mention anything about the NPS or its role at Indiana Dunes**.**
5. **Stewardship-** ***4 points*** the writing sample lists three things the student can do to assist in taking care of the Indiana Dunes. ***3 points*** the writing sample lists two things the student can do to assist in taking care of the Indiana Dunes. ***2 points*** the writing sample lists one thing the student can do to assist in taking care of the Indiana Dunes. ***1 point*** the writing sample does not list anything about what the student can do to take care of the Indiana Dunes.