Indiana Dunes Education

National Park Service
U.S. Department of the Interior

Indiana Dunes National Park
Education Department

A Royal Journey

Summary:

Come to the Douglas Center this fall for a multi-learning style education program. The participants will learn about the migrations, perils and importance of the Monarch Butterfly.

Intended Audience:

Aimed at first - fifth grade. Other younger or older audiences welcome and program will be adapted to adjust to grade level.

Program Description:

There will be thee rotating stations focusing on the Monarch. These stops will be in rotating orders where the students will be broken up into three equal size groups and rotate during their program time. A description of the rotating stations follows.

Length of Program:

Ideally, program length will be 2 hours and 30 minutes allowing 50 minutes at each stop. We will adjust stop length to fit in with school schedule. Groups are welcome to bring and eat their lunch at the Douglas Center after the program ends.

Ratio of students to ranger:

No more than 30 to 1 is requested. We will accommodate larger groups within reason with the teacher's assistance.

Objectives: students will be able to

1. Demonstrate they have created a conservation message of action to help the monarch.
2. Explain how at least three species are connected to specific habitats and whom the connection of habitats helps and the fragmentation of habitats hinders species.
3. Describe the life cycle of the monarch butterfly
4. Define the limiting factors of the monarch butterfly
5. Show on a map the migration routes of monarch butterflies.

Goals:

The goal of A Royal Journey is to spread the voice on conservation and need of this threatened species. We also strive to bring a scientist's journey into the concept of the student's thinking. The dynamic timeliness of necessity has inspired the Indiana Dunes National Park to invite and educate students of today and adults of tomorrow to learn and save this imperiled species.

It is our hope that the students will leave with a deeper understanding and appreciation of the Monarch Butterfly and their connection to our natural world and us.

What to Expect During Your Trip: There will be 3 stops in no particular order.

STOP: A craft to make two identical butterflies. The simple craft will make two identical butterflies. The student will also write on the back of each one an identical conservation wish or message. Scientists tag monarchs just as they band birds to study their migration routes and success. The students will also tag their butterflies. The tags will state a conservation message from the student to the butterfly.

One butterfly will be placed on the Douglas Center tree and one will go home with the student. Taking home the butterfly will allow the child to have something made to take with, a reminder of the day and a reminder of their conservation message written on the butterfly.

STOP: A game on migration. Scientists observations have allowed us to discover the migration pattern of the Monarch Butterfly. We know that monarchs travel great distances from Canada to Central Mexico. It takes many generations of butterflies make this journey. This game demonstrates migration describing the life cycle and geography of routes. Limiting factors are focused on and we discuss possible and realistic conservation actions we and society can take and do take.

STOP: Nature Hike focusing on connections of all life. The park is the hub of species and habitat diversity. The hike will focus on different species, their adaptations and the habitats they need.

Indiana and Illinois State Standards: The following Education Standards may be met while participating in this program.

INDIANA
Science Grade 1
Life Science

1.LS.2 Develop a model mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. Explore how those external parts could solve a human problem.

1.LS.3 Make observations of plants and animals to compare the diversity of life in different habitats.

1.LS.4 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

Earth and Space Science

1.ESS.4 Develop solutions that could be implemented to reduce the impact of humans on the land, water, air, and / or other living things in the local environment.

Engineering

K-2.E.1 Pose questions, make observations, and obtain information about a situation people want to change. Use this data to define a simple problem that can be solved through the construction of a new or improved object or tool.

Social Studies Grade 1
Geography
The World in Spatial Terms

1.3.1 Identify the cardinal directions (north, south, east and west) on maps and globes.

- Cardinal directions: north, south, east and west

1.3.2 Identify and describe continents, oceans, cities and roads on maps and globes.

Places and Regions

1.3.4 Identify and describe physical features* and human features* of the local community including home, school and neighborhood.

- **physical features**: geographic features that occur in nature, such as land and water forms, natural vegetation and wildlife
- **human features**: features created by humans, such as buildings, cities, roads and farms

Physical Systems

1.3.6 Explain the effect of seasonal change on plants, animals, and people.

Science Grade 2

Life Science

2.LS.1 Determine patterns and behavior (adaptations) of parents and offspring which help offspring to survive.

2.LS.2 Compare and contrast details of body plans and structures within the life cycles of plants and animals.

Engineering

K-2.E.1 Pose questions, make observations, and obtain information about a situation people want to change. Use this data to define a simple problem that can be solved through the construction of a new or improved object or tool.

Social Studies Grade 2

Geography

The World in Spatial Terms

2.3.1 Use a compass to identify cardinal and intermediate directions and to locate places on maps and places in the classroom, school and community.

- **Cardinal directions**: north, south, east and west
- **Intermediate directions**: northeast, southeast, northwest, and southwest

2.3.2 Locate the equator and the poles on a globe and identify the local community, state and the United States on maps.

Places and Regions

2.3.4 Compare neighborhoods in your community with those in other parts of the world.

Physical Systems

2.3.5 On a map, identify physical features of the local community.

- **Example**: Use maps and atlases to identify local bodies of water, crops and green spaces.

Science Grade 3

Life Science

3.LS.1 Analyze evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

3.LS.2 Plan and conduct an investigation to determine the basic needs of plants to grow, develop, and reproduce.

3.LS.3 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

3.LS.4 Construct and argument that some animals form groups that help members survive.

Engineering

3-5.E.1 Identify a simple problem with the design of an object that reflects a need or a want. Include criteria for success and constraints on materials, time, or cost

3-5.E.2 Construct and compare multiple plausible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Social Studies Grade 3

Geography

The World in Spatial Terms

3.3.4 Identify the northern, southern, eastern and western hemispheres; cardinal and intermediate directions; and determine the direction and distance from one place to another

Physical Systems

3.3.8 Identify the major climate regions of the United States and explain their characteristics

3.3.9 Describe how climate and the physical characteristics of a region affect the vegetation and animal life living there.

- Example: Growing seasons, types of crops grown, and animal hibernation and migration Environment and Society

3.3.12 Use a variety of resources to demonstrate an understanding of regional environmental issues and examine the ways that people have tried to solve these problems.

Science Grade 4

Earth and Space Science

4.ESS.4 Develop solutions that could be implemented to reduce the impact of humans on the natural environment and the natural environment on humans.
Life Science
4.LS.2 Use evidence to support the explanation that a change in the environment may result in a plant or animal will survive and reproduce, move to a new location, or die.

4.LS.3 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction in a different ecosystem.

Social Studies Grade 4

Geography

The World in Spatial Terms

4.3.2 Estimate distances between two places on a map when referring to relative locations.

Physical Systems

4.3.6 Describe Indiana's landforms (lithosphere*), water features (hydrosphere*), and plants and animals (biosphere*).

- **lithosphere**: the soil and rock that form Earth's surface
- **hydrosphere**: all the water on Earth's surface, including the hydrologic cycle (precipitation, evaporation, and condensation
- **biosphere**: all plants and animals

Human Systems

4.3.11 Examine Indiana's international relationships with states and regions in other parts of the world.

- **Examples**: Describe cultural exchanges between Indiana and other states and provinces, such as Rio Grande, do Sul, Brazil, or Zhejiang Province, China.

Environment and Society

4.3.12 Create maps of Indiana at different times in history showing regions and major physical and cultural features; give examples of how people in Indiana have modified their environment over time.

Science Grade 5

Life Science

5.LS.3 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Social Studies Grade 5

Geography

Places and Regions

5.3.3 Use maps and globes to locate states, capitals, major cities, major rivers, the Great Lakes, and mountain ranges in the United States.

Physical Systems

5.3.6 Use maps to describe the characteristics of climate regions of the United States.

ILLINOIS

Kindergarten Science

Structures and Processes

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

LS1.C: Organization for Matter and Energy Flow in Organisms ▪ All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow

Earth's Systems

K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs

- Systems and System Models ▪ Systems in the natural and designed world have parts that work together. (K-ESS2-2)

Earth and Human Activity

ESS3.A: Natural Resources ▪ Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

Kindergarten Social Studies

Inquiry Skills Developing Questions and Planning Inquiries
Constructing Essential Questions: SS.IS.1.K.-2: Create questions to help guide inquiry about a topic with guidance from adults and/or peers

First Grade Science

Structures and Processes

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

LS1.A: Structure and Function ▪ All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and

air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

LS1.B: Growth and Development of Organisms ▪ Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)

Structure and Function ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

Earth's Place in the Universe
Patterns ▪ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1),(1-ESS1-2)

First Grade Social Studies

Inquiry Skills Developing Questions and Planning Inquiries
Constructing Essential Questions SS.IS.1.K.-2: Create questions to help guide inquiry about a topic with guidance from adults and/or peers
Determining Helpful Sources SS.IS.2.K-2: Explore facts from various sources that can be used to answer the developed questions

Second Grade Science

Ecosystems: Interactions, Energy, and Dynamics
LS2.A: Interdependent Relationships in Ecosystems
Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

Biological Evolution: Unity and Diversity
LS4.D: Biodiversity and Humans ▪ There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

Engineering Design
K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

ETS1.A: Defining and Delimiting Engineering Problems ▪ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) ▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ▪ Before

beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

Second Grade Social Studies

Inquiry Skills Developing Questions and Planning Inquiries
Constructing Essential Questions **SS.IS.1.K.-2**: Create questions to help guide inquiry about a topic with guidance from adults and/or peers
Determining Helpful Sources **SS.IS.2.K-2**: Explore facts from various sources that can be used to answer the developed questions.

Geography Standards Geographic Representations:
Spatial Views of the World **SS.G.1.2**: Construct and interpret maps and other graphic representations of both familiar and unfamiliar places.
Human-Environment Interaction: Place, Regions, and Culture **SS.G.2.2**: Identify some cultural and environmental characteristics of your community and compare to other places.

Third Grade Science

Structures and Processes
3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
LS1.B: Growth and Development of Organisms ♣ Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.

Ecosystems
Cause and Effect ♣ Cause and effect relationships are routinely identified and used to explain change. (**3-LS2- 1**)

Heredity
3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.

Biological Evolution
LS2.C: Ecosystem Dynamics, Functioning, and Resilience ♣ When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)

Third Grade Social Studies

Inquiry Skills Developing Questions and Planning Inquiries
Constructing Essential Questions **SS.IS.1.3-5**: Develop essential questions and explain the importance of the questions to self and others.
Constructing Supporting Questions **SS.IS.2.3-5**: Create supporting questions to help answer essential questions in an inquiry

Critiquing Conclusions
SS.IS.7.3-5: Identify a range of local problems and some ways in which people are trying to address these problems.

Fourth Grade Science

Structures and Processes
4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Fourth Grade Social Studies

Inquiry Skills Developing Questions and Planning Inquiries
Constructing Essential Questions **SS.IS.1.3-5**: Develop essential questions and explain the importance of the questions to self and others.
Constructing Supporting Questions **SS.IS.2.3-5**: Create supporting questions to help answer essential questions in an inquiry.

Communicating Conclusions and Taking Informed Action Critiquing Conclusions
SS.IS.7.3-5: Identify a range of local problems and some ways in which people are trying to address these problems.

Fifth Grade Science

Energy

5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun

Ecosystems

LS2.A: Interdependent Relationships in Ecosystems ♣ The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (**5-LS2-1**)

Earth and Human Activity

ESS3.C: Human Impacts on Earth Systems ♣ Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (**5-ESS3-1**)

Fifth Grade Social Studies

Inquiry Skills Developing Questions and Planning Inquiries Constructing Essential Questions **SS.IS.1.3-5**: Develop essential questions and explain the importance of the questions to self and others.
Constructing Supporting Questions **SS.IS.2.3-5**: Create supporting questions to help answer essential questions in an inquiry.

Geography Standards

Human-Environment Interaction: Place, Regions, and Culture **SS.G.1.5**: Investigate how the cultural and environmental characteristics of places within the United States change over time

Activity

The following activities will allow you and your students to prepare for the program. They highlight science, math and social studies.

*Copy, distribute and discuss this migration map.

*Calculate the distances between the countries and determine how far they might fly in one day.

*The first generation of monarchs begins in Mexico. There will be three more generations of Monarchs before they reach Canada.

*Gather pictures of the students, a picture of their parents, a picture of their grandparents and a picture of their great grandparents. Contrast the differences in life spans between people generations and the four monarch generations.

*Go out in your schoolyard. Look for flowering species and identify them. Are any of them species that butterflies use to lay their eggs on? These then would be that butterfly's host plant. The Milkweed is the Monarch's host plant.

* Explore different types of metamorphosis and the life stages involved. The Monarch has complete metamorphoses where it pupates and emerges a butterfly.

*The following pictures are some of the different kinds of Milkweed that grow in our area. Discuss which habitats these different species grow. The last picture is of a non-native species of Milkweed. It has a longer growing time. But, this unnatural trait actually hurts the Monarch. See if the students can think of a reason why. This disguised threat will be discussed on the program.

WHORLED MILKWEED

SWAMP MILKWEED

GREEN MILKWEED

COMMON MILKWEED

BUTTERFLY WEED

TROPICAL MILKWEED