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Using this Guide

Building science literacy on the part of students includes teaching science content as well as building familiarity with the work of scientists. Providing the opportunity to participate in inquiry-based explorations helps students identify with the scientific process and build their own research skills. They learn about the work of scientists by actively participating in the research process themselves. This guide is designed to support you as you work to build research skills among your students aligning with the established classroom curriculum.

This guide contains a variety of research activities that encourage students to explore the complex ecosystem at our recently restored wetland area, Nature Boardwalk at Lincoln Park Zoo. Many activities can also be modified slightly for use in the school yard or a nearby park. Through this guide, students will learn about field journals, soil investigations, bird watching, animal tracking and studying animal behavior.

Let’s get started!
Spend a few minutes getting to know Lincoln Park Zoo. What animals do you hope to visit?

**Exhibits**
1. Regenstein Birds of Prey Exhibit (Vultures, Eagles, Owls)
2. McCormick Bird House (Tropical Birds)
3. Regenstein African Journey (Giraffes, Rhinos, Meerkats)
4. Regenstein Macaque Forest (Snow Monkeys)
5. Helen Brach Primate House (Monkeys)
6. Kovler Lion House (Lions, Tigers)
7. Kovler Seal Pool (Seals)
8. Pritzker Family Children’s Zoo (Bears, Otters, Wolves)
9. Regenstein Small Mammal-Reptile House (Snakes, Bats)
10. Hope B. McCormick Swan Pond (Swans, Ducks)
11. Waterfowl Lagoon (Flamingos, Geese)
12. Regenstein Center for African Apes (Chimpanzees, Gorillas)
13. Antelope & Zebra Area (Antelope, Zebras, Kangaroos)
14. Farm-in-the-Zoo (Cows, Goats, Pigs, Ponies)
15. Nature Boardwalk at Lincoln Park Zoo

**Shops**
23. Safari Shop*: Make your own wild animal—inside the Kovler Lion House.
24. Wild Gifts Kiosk*: Remember your visit with a great ape keepsake—outside Regenstein Center for African Apes.

**Rides**
25. Lionel Train Adventure*: Hop aboard this kid-friendly locomotive.
26. AT&T Endangered Species Carousel*: Take a ride with your favorite animal.

**Facilities**
27. Gateway Pavilion
28. Judy Keller Education Center
29. Tadpole Room
30. Bus Drop-Off Zone
31. Foreman Pavilion*
32. Peoples Gas Education Pavilion*
*Open seasonally

**Food**
16. Safari Café*
17. Café at Wild Things*
18. Eadie Levy’s Landmark Café*
19. Park Place Café
20. The Patio at Café Brauer*
21. Ice Cream Shoppe*

We’re building state-of-the-art homes for polar bears and African penguins.
Frequently Asked Questions

The Nature Boardwalk at South Pond seems really big. Is it too much walking for younger students?  
The distance around the boardwalk is approximately ¾ mile. Most students can walk around comfortably given a reasonable pace and plenty of time. There are benches placed at intervals all around the boardwalk where students may stop and rest, as well as a large dock near the Peoples Gas Education Pavilion where the whole class can relax or regroup. As an alternative, students can also gain an appreciation for this local ecosystem by simply exploring a portion of it.

What animals will we see at Nature Boardwalk?  
Nature Boardwalk is a natural haven for birds, fish, turtles, insects and more. However, as a natural ecosystem, the population is ever-changing. The animals that you see will depend on when you visit. Some species that have been seen at Nature Boardwalk include American bullfrog, largemouth bass, bluegill, Canada goose, mallard, black-crowned night heron and wood duck.

I want my students to be prepared. How can I plan for what we’ll see at Nature Boardwalk?  
Your visit can vary greatly based on the time of year that you’re planning to visit. If possible, we recommend that you plan a preview visit to the Nature Boardwalk a few days or weeks prior to your scheduled field trip. There is no admission fee and it is accessible to the public. If a preview is not possible, information can be found by visiting lpzoo.org/nature-boardwalk.

How is this relevant to the required curriculum?  
National or state standards may not emphasize spending time outdoors, but they do advocate skills such as making observations and collecting data. Furthermore, the activities discussed in these guides also address standards in English language arts and mathematics. We also noted how each activity aligns with the new K-12 frameworks. While we note the specific Scientific Practices for each lesson, all lessons and activities are related to the Life Sciences Core Idea: Ecosystems.
Logistics and Planning

A little preparation will ensure your visit to Nature Boardwalk goes smoothly. Here are some tips to get your planning started.

Make a Reservation
We ask all groups planning a visit to Nature Boardwalk at Lincoln Park Zoo to register online. While there is no charge for your visit, this form helps us determine staffing needs so that we can provide our visitors with the best possible experience. Register at lpzoo.org/plan-your-field-trip-chicagos-free-zoo.

Managing your Day
Be prepared for the logistics of the day. You’ll want to:

Allow Enough Time—Select a departure time from your school that allows for traffic delays and parking lot congestion.

Plan for Emergencies—Bring along a cell phone as well as school and parent contact information.

Plan for Bathroom Breaks—Bathroom locations are listed in the map provided in this guide. Locations located nearest Nature Boardwalk include:
- Lower level of Park Place Café
- Farm-in-the-Zoo
- Foreman Pavilion
- Regenstein Small Mammal-Reptile House

Select Lunch Location—There are several areas set aside for you to enjoy a bag lunch. Outdoors, you may select from picnic tables near the bus drop-off area or the sheltered Foreman Pavilion. In the event of cold weather, you may eat in the Tadpole Room, located on the lower level of the Park Place Café.

We do not provide lunch storage areas and recommend that each student wear a backpack to carry his or her own lunch during the visit to the zoo. Alternately, each chaperone may carry a book bag with lunches for the students for whom he or she is responsible.

Seating at the tables associated with our Zoo Foods locations throughout the zoo is reserved for customers only. This includes the Landmark Café, Park Place Café, Café Brauer and the Café at Wild Things. We thank you in advance for your understanding.

Do’s and Don’ts of Field Work

Do:
- Find a secure, safe space to complete the activity
- Set boundaries
- Bring all needed supplies
- Take photographs, draw pictures, and write about what you’ve observed
- Encourage collaboration to expand learning
- Use four senses (no tasting)
- Remain quiet: loud noises may affect animal behavior

Don’t:
- Stray from pre-marked trails
- Chase, scare, or harm wildlife
- Take anything home
- Leave anything behind
Activity 1
Field Journals

Activity Overview
Students use field journals to record observations of their environment.

Objective
Students will record observations in a field journal through drawing, writing and/or photography.

Materials
• Field journal template (provided on pg. 8), notebook or sheet of paper
• Clipboard
• Writing utensil
• Digital camera (optional)
• Field guides (provided) pgs. 9, 10, 11, and 24

Scientific Practices
• Asking questions
• Analyzing and interpreting data
• Obtaining, evaluating and communicating information

Procedure
Begin by engaging students in a discussion of field work that they have completed or will soon complete. Explain that drawing, sketching or writing about what you observe is a good way to collect data without disrupting the environment.

Prompt students to consider what they would like to learn by keeping a journal. The class or individual students should generate a driving question to guide observations. More advanced students may develop a hypothesis as well. The driving question and/or hypothesis will influence the types of data recorded.

Examples of driving questions include:
• What types of plants are in this environment?
• What types of animals are in this environment?
• How do the plants and/or animals interact with each other and with the habitat?
• Are the plants and/or animals in this environment healthy?
• How are the plants and/or animals in this environment influenced by the seasons?
• How are the plants and/or animals in this environment influenced by weather conditions?
• How are the plants and/or animals in this environment influenced by the time of day?

Review class standards for writing and teacher expectations for how information should be recorded in field journals. Scientists use a variety of methods to record data in field journals. These include:
• Sketching simple pencil drawings
• Creating color drawings or watercolor pictures
• Using charts, lists or tables to record data

Review expectations for the type of information that will be recorded. Scientists record various types of data in field journals. These include:
• Detailed information about a single item (such as a leaf)
• Information about the field work site
• Information about the temperature and the weather
• Information about the time of year and the time of day
• Questions, reactions or feelings one might have during the observation

Some students may require prompts for journaling such as:
• What do I see?
• Does anything I see surprise me?
• What time of day is it?
• What is the weather like today?
• How is this different from my previous visit?
• What can I learn by observing ________?
• What type of information might help me answer my driving question: ________________?

Students can now begin fieldwork and journaling. Arrange for exploration of a natural environment, such as Nature Boardwalk at Lincoln Park Zoo or schoolyard. Ideally, this activity will be repeated in the same location at various times of the day and year.

**Evaluation**
A three-point scoring rubric with the following criteria can be used to evaluate completed journal entries:

3 Points: Student records information with high level of detail
2 Points: Student records information with a moderate level of detail
1 Point: Student records information with minimal detail

**Extension**
After recording their observations in a field journal, encourage students to use a field guide to identify the species they encountered.

**FIND OUT MORE**
Fieldwork is a way to create a record of what is going on in nature. A scientist may keep a journal for weeks, months or even years, and use it to notice patterns in the natural world.
Field journals are appropriate for students at a variety of developmental levels, and can be used to accomplish a variety of academic purposes. This lesson is open-ended, allowing teachers to decide how field journals can best be used in their classroom.

**Illinois State Learning Goals**

**Language Arts:** 1A, 1B, 1C, 2A, 3A, 3B, 3C, 4A, 4B, 5A

**Math:** 7C, 9B, 10A, 10B

**Science:** 11A, 12A, 12B, 12E, 13A, 13B

**Next Generation Science Standards**

**Science & Engineering Practices**
- Asking questions
- Developing and using models
- Planning and carrying out investigations
- Obtaining, evaluating, and communicating information

**Disciplinary Core Ideas**
- MS-LS2.A
- MS-LS2.C

**Crosscutting Concepts**
- Patterns
- Scale, proportion, and quantity
- Stability and change
# Field Journal Data Sheet

**Researcher**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Temperature</th>
</tr>
</thead>
</table>

**Location**

**Weather Description**
Nature Boardwalk Field Guide: Plants

Butterfly Milkweed
Asclepias tuberosa

Black-Eyed Susan
Rudbeckia hirta

Nodding Wild Onion
Allium cernuum

Switch Grass
Panicum virgatum

Rattlesnake Master
Eryngium yuccifolium

Prairie Avens
Geum trifolium
Nature Boardwalk Field Guide: Dragonflies and Damselflies

Black Saddlebags
*Tramea lacerat*

Red Saddlebags
*Tramea onusta*

Blue Dasher
*Pachydiplax longipennis*

Common Green Darner
*Anax junis*

Bluet Damselfly
*Enallagma civile*

Calico Pennant
*Celithemis elisa*

*(Female and male are similar in appearance.)*
Nature Boardwalk Field Guide: Birds

Red-Winged Blackbird
*Agelaius phoeniceus*

House Sparrow
*Passer domesticus*

Barn Swallow
*Hirundo rustica*

Ring-Billed Gull
*Larus delawarensis*

Northern Cardinal
*Cardinalis cardinalis*

European Starling
*Sturnus vulgaris*
Activity Overview
Students will learn methods of observing birds in a natural environment.

Objective
Students will practice bird-watching skills.

Materials
• Bird-watching data sheet (provided)
• Clipboard
• Writing utensil
• Field guides (provided) pgs. 11 and 24
• Binoculars (optional)
• Camera (optional)

Scientific Practices
• Asking questions
• Analyzing and interpreting data
• Obtaining, evaluating and communicating information

Procedure
Prior to beginning this activity, review characteristics of birds with students. See “Find Out More” on pg. 13 for discussion ideas. Confirm student understanding of what makes a bird different from other animals, such as mammals, reptiles or insects. Engage students in the conversation by asking them to describe familiar birds. Students may recall seeing gulls, red-wing blackbirds, Canada geese or perhaps a robin near their school or in their home neighborhood. Ask students to describe the similarities and differences between these familiar species.

Prepare students for the activity by explaining that today they will have the opportunity to practice bird watching. Review the bird-watching data sheet with students. Consider what information might be included in each portion of the data sheet. Ask students to predict what birds they might see or hear.

Once outdoors, begin looking for birds. Encourage students to use both their ears and their eyes to find and identify birds. Also, identify the habitat where birds are seen during this exploration. Are you observing birds near a pond? In a school yard? In a wooded area?
As a class, have students close their eyes and listen silently. After a few moments, ask them to open their eyes and describe the sounds they heard. Did anyone hear a bird?

While continuing to listen for birds, encourage students to begin bird watching using their eyes. Remind students to look carefully in a variety of locations: in a tree, in the middle of a pond, or on a high ledge.

Ask students to describe field markers or visible characteristics of a bird, such as its color, shape or length. Also ask students to observe and describe the bird’s behavior. Is it flying? Perching? Floating in water?

Have the students complete their observation sheet as they conduct their investigations.

**Evaluation**

A three-point scoring rubric with the following criteria can be used to evaluate student participation in the data collection and analysis process:

**Data Collection**

3 Points: Data sheet is complete
2 Points: Data sheet is partially complete
1 Point: Data sheet is incomplete

**Data Presentation**

3 Points: Data presented accurately; there are no errors
2 Points: Data presented somewhat accurately; there are some errors
1 Point: Data presented inaccurately; there are multiple errors

**Extensions**

- Allow students to use binoculars to look more closely at birds. To use the binoculars, students should first look at the bird, then bring the binoculars to their eyes without moving their gaze. The binoculars can then be adjusted for clarity as needed. Often, students will need to practice using the binoculars for some time before they are able to do so with ease.
- Students can be encouraged to use a field guide to identify the bird that they observed (see pgs. 11 and 24).
- Using a camera, take pictures of the birds observed. Use the photos, along with the data collected by students, to create a class field guide.

**FIND OUT MORE**

Birds can be distinguished from other animals by characteristics they have in common.

All birds...

- have feathers
- lay eggs
- have wings
- have beaks

Birds may move differently, such as walking, flying or even swimming. They may eat different things too—from seeds and fruit to insects or fish.

Birds are likely to be most active in the morning, but this activity can be completed any time of day (and in virtually any outdoor location) as your school schedule allows.

**Illinois State Learning Goals**

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<th>Math:</th>
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<tr>
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<td>7C, 9A, 10A, 10B</td>
</tr>
<tr>
<td>Science:</td>
<td></td>
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<tr>
<td>11A, 12A, 12B, 13A, 13B</td>
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</table>

**Next Generation Science Standards**

**Science & Engineering Practices**

- Asking questions
- Planning and carrying out investigations
- Obtaining, evaluating, and communicating information

**Disciplinary Core Ideas**

MS-LS2.A

**Crosscutting Concepts**

- Patterns
- Scale, proportion and quantity
- Structure and function
Bird Watching Data Sheet

Pick one bird to observe. Place an “X” in the box that describes where the bird spent most of its time. Then draw the bird in its habitat in the box below.

- High up in the sky
- On branches or trees
- On the ground or water

Sound: Describe any noises the bird made

Behavior: Describe what you saw the bird doing

Physical Characteristics: Describe what the bird looked like

Draw a picture of the bird’s feet:

Draw a picture of the bird’s beak:
Activity 3
Soil Explorations

Activity Overview
Students explore soil to better understand its role in a healthy ecosystem.

Objective
Students will explore properties of soil.

Materials
• Soil data sheet (provided)
• Clipboard
• Writing utensil
• Towel or wipes to clean hands
• Pocket magnifier (optional)
• Camera (optional)

Scientific Practices
• Asking questions
• Planning and carrying out investigations
• Analyzing and interpreting data
• Constructing explanations
• Engaging in argument from evidence
• Obtaining, evaluating and communicating information

Procedure
Prepare students by explaining that today they will have the opportunity to observe soil in the field. Engage students by asking them to describe soil from memory. Determine students’ prior knowledge about and understanding of soil through discussion. Discussion prompts may include:
• What is soil?
• Is all soil the same?
• Does anything live in soil?

Review the soil data sheet with students. Ask them to consider what information might be included in each portion of the data sheet.

Take students outdoors and have them record overall information about the field site. The teacher should then lead students through the following soil investigations, asking them to look more closely and record information found on the provided data sheet.
Soil Texture: Ask students to take a small amount of soil into their hands. The amount should be less than a tablespoon. They should rub the soil between their palm and fingers, noting the texture of the soil.

- Coarse soil with many pebbles is gravel
- Coarse soil with fine grains and no pebbles is sand
- Velvety, soft, smooth soil is loam
- Smooth, slimy soil that becomes sticky when wet is clay
- Students may also find that the soil they are feeling is a combination of two or more types of soil.

Scientists will describe soils with combined names to correctly identify the soil. For example, a student may find that they have a sandy loam.

Soil Appearance: Ask students to look closely at the soil. Soil color can vary greatly depending on the chemicals in the rock that produced the soil. Students may describe the soil as dark, gray, brown or red. As with texture, soil appearance may also be described as a combination.

Mineral Matter in the Soil: Mineral matter in soil may take the appearance of bits of clay, silt, sand, rocks or stones. Students should carefully observe the soil, perhaps using a pocket magnifier or a magnifier box.

Organic Matter in the Soil is also called humus: A brown or black organic substance consisting of partially or wholly decayed vegetable or animal matter that provides nutrients for plants and increases the ability of soil to retain water.

Animals in the Soil: Students may find insects, arachnids, earthworms, or snails in the soil. Students should visually observe these animals, handling them as little as possible and with care.

After students have completed recording information about the properties of soil, it is important to remind them to return any soil to the place where it was found.

Evaluation
Upon returning to the classroom, students should share what they observed with their classmates, comparing similarities and differences in the soil observations. The data sheet can be evaluated by using a three-point scoring rubric with the following criteria:

Data Collection
3 Points: Data sheet is complete
2 Points: Data sheet is partially complete
1 Point: Data sheet is incomplete

Data Presentation
3 Points: Data presented accurately; there are no errors
2 Points: Data presented somewhat accurately; there are some errors
1 Point: Data presented inaccurately; there are multiple errors

Extensions
- Students or teachers may take photographs of the soil and items found in the soil to create a book about soil.
- Students may complete the soil observation activity in various locations and compare their observations.

Illinois State Learning Goals


Next Generation Science Standards

Science & Engineering Practices
- Asking questions
- Planning and carrying out investigations
- Analyzing and interpreting data
- Obtaining, evaluating, and communicating information

Disciplinary Core Ideas
- 5-LS2.A
- 5-LS2.B
- MS-LS2.B

Crosscutting Concepts
- Scale, proportion and quantity
- Structure and function
- Systems and system models
Soil Explorations Data Sheet

______________________________

Researcher

Location _______________________

Weather _______________________

Soil Appearance (color): _______________________

Soil texture (select the elements in the soil sample):

☐ Gravel ☐ Sand ☐ Loam ☐ Clay ☐ Wet ☐ Dry

What was in the soil?

☐ Minerals (clay, rocks, silt, sand or stones)

☐ Humus (dark, decayed organic part of soil)

☐ Animals (insects, arachnids, earthworms or snails)

Draw a picture of the soil sample:

© 2016 Lincoln Park Zoo
Activity 4
Animal Tracking

**Activity Overview**
Students will observe where various animals are found at Nature Boardwalk and will create maps displaying animal location.

**Objective**
Students will map animal location

**Materials**
- Nature Boardwalk map (provided)
- Clipboard
- Writing utensil
- Camera (optional)
- Field guides (provided) pgs. 9, 10, 11 and 24

**Scientific Practices**
- Asking questions
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations
- Engaging in argument from evidence
- Obtaining, evaluating and communicating information

**Procedure**
Engage students by asking them to predict what animals they might see while visiting Nature Boardwalk.

Students may observe familiar local wildlife such as Canada geese, squirrels or rabbits. Students are also likely to see animals that are observed near water, such as fish and turtles.

Prepare students for the activity by explaining that they will observe animals near Nature Boardwalk and then have the opportunity to create a map demonstrating where various animals can be found. Review the map of Nature Boardwalk (see pg. 20) and remind students of the importance of staying on the path to protect fragile plant life.
Once at Nature Boardwalk, students should begin by seeking local wildlife. Younger students may choose one species to highlight on their map, while older students may record each species they notice. Students should create a symbol for each animal they see, and define the symbol. For example a ⬤ may denote a turtle. Students should record the symbols in the “key” portion of the provided map.

After creating the map key, students should begin using the map to record where animals are observed. Students may focus on a small portion of Nature Boardwalk or take the time to explore, and record findings, throughout the area. Remind students to observe carefully and to look in a variety of locations, such as up in trees, in the grass or in the water. Students may choose to add relevant landscape features, such as trees, to their map. Older students may also include narrative descriptions of animal locations.

**Evaluation**
A three-point scoring rubric can be used to evaluate student participation in the data collection process.

**Data Collection**
- 3 Points: Map is complete
- 2 Points: Map is partially complete
- 1 Point: Map is incomplete

**Data Presentation**
- 3 Points: Data presented accurately; there are no errors
- 2 Points: Data presented somewhat accurately; there are some errors
- 1 Point: Data presented inaccurately; there are multiple errors

**Extensions**
- Students or teachers may take photographs of the animals encountered and include them with the maps they’ve created.
- Students may return to Nature Boardwalk and track animals at various times of the day and year.

**RESEARCH CONNECTION**
Scientists at Lincoln Park Zoo actively track what kinds of animals visit Nature Boardwalk and where they spend time once there. For many species, this tracking is done in much the same way your students might complete this activity: by observing carefully and keeping records of which animals are seen and where. However, our scientists observe the movement of some of the Nature Boardwalk residents—painted turtles—using a more technological approach.

Several painted turtles are equipped with transmitters, which allow scientists to track turtles as they move throughout the pond. The transmitter sends a radio signal that is picked up by a receiver. The signal is then used to triangulate, or determine, each turtle’s position.

While at Nature Boardwalk keep an eye out for painted turtles! The turtles are often seen basking on rocks southeast and southwest of the island in the pond during the middle of the day. You may even see one wearing a transmitter.

**Illinois State Learning Goals**


**Next Generation Science Standards**

**Science & Engineering Practices**
- Developing and using models
- Planning and carrying out investigations
- Obtaining, evaluating, and communicating information

**Disciplinary Core Ideas**
- MS-LS2.C

**Crosscutting Concepts**
- Patterns
- Scale, proportion and quantity
- Systems and system models

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Nature Boardwalk Map
Activity 5
Studying Animal Behavior

Activity Overview
Students practice observing and recording animal behavior using an ethogram.

Objectives
• Students will gain an understanding of what an ethogram is and why scientists use them.
• Students will observe a species of waterfowl using an ethogram.

Materials
• Ethogram data sheet (provided)
• Field guide (provided) pg. 24
• Stopwatch or clock with a second hand
• Writing utensil
• Clipboard

Scientific Practices
• Asking questions
• Developing and using models
• Planning and carrying out investigations
• Analyzing and interpreting data
• Using mathematics and computational thinking
• Constructing explanations
• Engaging in argument from evidence
• Obtaining, evaluating and communicating information

Procedure
Before beginning the observation, explain to students that they will be learning about ethology, or the study of animal behavior. Provide students with a copy of the selected ethogram data sheet and a clipboard.
Explain they will be using interval sampling during the activity. With interval sampling, they will not write down everything they observe about the animal, but instead will record what behaviors they observe at selected time intervals. The ethogram data sheet will guide them in which behaviors to look for and record.

You can now take students to the study site and ask them to identify a single waterfowl (aquatic freshwater bird) for their focus animal. Common waterfowl at Nature Boardwalk include mallards, Canada geese and wood ducks. More than one student can observe the same bird as long as they are not located too closely together. Before using their data sheets, students should be allowed some time to simply observe the bird and discuss what they see with a peer. Discussion topics can include:

• What can you tell me about the bird’s appearance and behavior?
• What do you think the bird might do next?
• What have you learned by watching the bird?
• What do you think will be the most common behavior for this bird?
• What do you think would be the least common behavior for this bird?

Students will now focus on collecting their data. Either provide students with a stopwatch or serve as the time keeper, announcing each interval “time” to facilitate data recording. Encourage students to remain quiet throughout the entire length of the observation. Loud noises may affect animal behavior.

After data is collected, return to the classroom. In the classroom encourage discussion about what students observed. Suggested discussion questions include:

• What behavior occurred most often? Is this different from what was predicted?
• What behavior occurred least? Is this different from what was predicted?
• What conclusion can be made about the animal’s behavior from your observations?

**Modifications**

Intervals and the number of samples taken may vary with students’ age and developmental levels.

**Extensions**

• Encourage two or more students to observe the same animal. Compare results and discuss any discrepancies. Are the differences due to varied interpretations of behavior? Inaccuracies? Something else?
• Students may complete the ethograms at various times of day to compare results.
• Students may use the ethogram as a portion of a more in-depth study of a particular animal species.

**Illinois State Learning Goals**

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**Next Generation Science Standards**

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<th>Science &amp; Engineering Practices</th>
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<td>Scale, proportion and quantity</td>
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<td></td>
<td>Structure and function</td>
</tr>
</tbody>
</table>
# Ethogram and Observation Data Sheet: Waterfowl

**Researcher**

**Species**

**Fighting**
Active aggression such as chasing or biting

**Feeding**
Actively eating aquatic plants or other vegetation

**Floating**
Floating on top of the water without active movement

**Flying**
Flying through the air for more than three seconds

**Preening**
Smoothing or cleaning feathers with the beak

**Swimming**
Actively moving on top of the water

**Walking**
Taking more than three steps

**Not Visible**
Bird cannot be seen

**Other**
Behavior other than the ones described above

<table>
<thead>
<tr>
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Nature Boardwalk Field Guide: Common Waterfowl

Mallard Duck
Anas platyrhynchos

Ring-necked Duck
Aythya collaris

Wood Duck
Aix sponsa

Blue-winged Teal
Anas discors

American Coot
Fulica americana

(Female and male are similar in appearance.)

Canada Goose
Branta canadensis
Studying an animal’s behavior can provide scientists with valuable information that can aid in conservation efforts. The study of animal behavior is called ethology. Scientists use ethograms to help with this research.

When scientists conduct animal observations, they rely on specific procedures in order to collect data that is as accurate as possible. Researchers use an ethogram as part of these procedures. Ethograms are a list of all the possible behaviors an animal might exhibit. Using an established ethogram helps ensure the data collected by lots of different scientists is similar enough to be compared. As you can imagine, scientists might use different ethograms for different species to capture the unique behaviors of each. Scientists might also use different ethograms for the same species. These ethograms may be more specialized and focus on types of behavior such as maternal care or social aggression.

There are many different ways to collect data on animal behavior. In interval sampling, observers note what an animal is doing at pre-set, evenly spaced time intervals. This allows the researcher to get a clear “snapshot” of an animal’s behavior at a precise moment in time. When multiple observations are combined, researchers can begin to draw conclusions about which types of behaviors might be most common for a species, or when certain types of behaviors are most likely to occur.
Connecting with Families

The zoo isn’t the only location where students can conduct research on natural areas such as forests and wetlands. All of the activities in this guide can easily be amended to implement in any natural space. You may want to send a blank notebook home with each student to serve as a field journal. On the inside cover, you can provide suggestions for observations and activity prompts by using a template like the one below. As the zoo is free and Nature Boardwalk is accessible without an admission fee, you can also encourage families to come back and explore on their own.

Research at Home
Use your field journal to record observations and discoveries. Here are sample topics to get you started:

• Is the grass at Nature Boardwalk similar to grass near my home?
• Do wood ducks behave differently than mallards?
• Will I find more Canada geese near my home or at Nature Boardwalk?
• What is the most common species of bird at Nature Boardwalk? Is this the same near my home?
• Are there more types of bird species at Nature Boardwalk or near my home?
Dear Family Members and Friends,

We’ve been learning about scientific research in class and how to explore natural areas right here in Chicago. Continuing these investigations at home is a great way to reinforce what students have learned as well as extend the learning experience.

Questions you may want to ask your child in order to learn more about our classroom projects include:

- What did you learn about animals that live at Nature Boardwalk?
- What types of things did you see during your visit?
- Were you able to see bird species you don’t see near our home?
- Did you perform any investigations during your visit?

Observing wildlife is something you can do at home as well. Encouraging your child to keep a science journal and take notes on the different things he or she might notice in the neighborhood is a great way to reinforce these skills. Topics he or she might want to focus on could include:

- Recording the different types of birds in your neighborhood
- Describing the different types of soil near your home
- Counting the different plant species they encounter during a walk around the block

You might also want to plan a trip to Nature Boardwalk at Lincoln Park Zoo to explore nature right in the center of Chicago. The zoo and the boardwalk are open 365 days a year, including holidays, and there are no admission fees. You can learn more about visiting the zoo and Nature Boardwalk at lpzoo.org.

Sincerely,

Teacher/Chaperone