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Acknowledgements
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  Collins, Openlands Lakeshore Preserve Site Manager; and John Cawood, Openlands Education Program
  Coordinator, in collaboration with Julyne Segar, a contracted Curriculum Specialist.

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THE GRAINGER FOUNDATION

  Photos on pages 3, 4, 8 and 9 by Openlands (2010-2013). Photo on page 52 courtesy of Wikimedia Commons (2011).
Program Overview

Learning about erosion by building models
Welcome to Eco-Explorations at the Openlands Lakeshore Preserve!

The Openlands Lakeshore Preserve – A Regional Treasure
Located in the Highland Park area on the shores of Lake Michigan, the Openlands Lakeshore Preserve is a 77-acre public nature preserve that offers a unique glimpse of rare lakefront, ravine, and bluff ecosystems. Once part of the Fort Sheridan military base, the Preserve property was acquired by Openlands when the Fort was decommissioned and in 2011, we opened the site to the public.

With generous financial support from many donors, the Preserve has undergone meticulous restoration of its rare ecosystems, which support six state endangered and threatened plant species and serve as an important stop for migrating birds. An ADA-compliant multi-use trail system and an innovative art-based interpretation plan help make the site accessible and deepen the experiences of our visitors in nature. It is our goal to encourage people of all ages to learn about and appreciate this regional treasure, now dedicated as an Illinois Nature Preserve.

Please see our website at www.openlands.org for more information about the Preserve.

The Eco-Explorations Program
The Eco-Explorations Program is a curriculum-based nature experience that begins with lessons provided by Openlands, which are taught in the classroom by teachers. Student understanding of the lesson concepts in science, writing, and other subjects is then enhanced by two site visits to the Preserve each school year (autumn and spring). Each visit is facilitated by an educator and includes activities that build upon classroom work in an experiential outdoor setting.

The curriculum is divided into “abiotic” concepts in the autumn and “biotic” concepts in the spring, all aligned with Common Core standards. Topics explored in autumn include ravine ecosystems, erosion, naturalist observation methods, and nature journaling. In spring, the focus shifts to habitat and the Preserve’s native plant and animal residents, with continued activities in nature observation, journaling, and using the scientific method.

Openlands provides the program curriculum, most materials, bus transportation, teacher training and support, and a professional educator for each on-site visit, at an estimated value of $2,600 per classroom.

Learning Standards
The Eco-Explorations program is carefully designed to align with Common Core and Next Generation Science standards. An overview of the standards met by each lesson is provided on the chart found in the Appendices.

Memorandum of Understanding
Openlands requires that the principal of each participating school, along with each participating teacher, review and sign a Memorandum of Understanding (MOU) at the start of each school year. This document outlines what Openlands provides in the partnership, and also details what is required of each participating teacher throughout the course of the school year. Failure by the school to sign the MOU or uphold their requirements listed on the document may result in Openlands terminating the partnership with the school. Openlands staff facilitates MOU signatures starting around August of each school year. See the Appendices for the MOU form.

The Preserve has an entire mile of beach to explore!
Teacher Orientation Sessions

As stated in the MOU, all participating teachers are required to attend a teacher orientation session for the program. A modified refresher orientation session is offered for teachers who have previously participated in the program. Openlands reserves the right to close the Eco-Explorations program to teachers who do not participate in a required orientation session.

Sessions led by Openlands staff and educator(s) are held in the beginning of September during each school year. These sessions are approximately two hours in length and contain a broad overview of the program structure, a visit to the Preserve for new teachers joining the Eco-Explorations program, and a discussion of the curriculum with opportunities to share ideas with staff and other teachers. Openlands staff will coordinate the sessions with teachers starting in August of each school year.

Scheduling

Openlands staff coordinates directly with teachers all scheduling of teacher orientation sessions, autumn and spring visits to the Preserve, and bus transportation. This is generally done via email.

All visits begin at the Midwest Young Artists building in the old historic district of the former Fort Sheridan (now a residential community). Buses arrive at this location in the morning, and here students have an opportunity to take a quick restroom break and meet the educator. The educator will then ride on the bus with the class to direct the driver to the Preserve, located just a short distance away. The bus driver will pick up the students in the afternoon at the Preserve. A return visit to the Midwest Young Artists building for another restroom break prior to heading back to the school is available at the discretion of each teacher.

On-site visits begin between 9:45-10:00 a.m. and wrap up between 1:00-1:30 p.m. We are able to be somewhat flexible with times if needed. A typical on-site visit is as follows:

<table>
<thead>
<tr>
<th>Total time per visit:</th>
<th>3 hours (2.5 hours for guided program and 0.5 hours for lunch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus arrival:</td>
<td>Arrive at Midwest Young Artists Building after 9:30 a.m.</td>
</tr>
<tr>
<td>Program start time:</td>
<td>Between 9:45-10:00 a.m.</td>
</tr>
<tr>
<td>Lunch break:</td>
<td>0.5 hours, typically 11:45 a.m. to 12:15 p.m. (time may vary)</td>
</tr>
<tr>
<td>Program end time:</td>
<td>Between 1:00-1:30 p.m.</td>
</tr>
<tr>
<td>Bus departure:</td>
<td>Leave Midwest Young Artists Building between 1:00-1:30 p.m.</td>
</tr>
<tr>
<td>Maximum group size:</td>
<td>35 students per classroom (may combine classrooms)</td>
</tr>
</tbody>
</table>
Transportation

Openlands staff will arrange the bus transportation for each on-site visit, and a confirmation of the transportation order with pick-up and drop-off times will be emailed to each teacher prior to the trip. All bus transportation is paid by Openlands.

If for some reason you encounter trouble with your bus the day of your visit, please contact John Cawood, Education Program Coordinator, right away at 312-863-6276.

The bus company is given detailed directions from Openlands at the time of the transportation order, but teachers should consider bringing along directions just in case. See the map with written directions in the Appendices.

The historic district of Fort Sheridan contains many original military buildings dating from the 1890’s, now renovated as private residences. Teachers may wish to complement their visit to the Preserve by having the bus driver circle the old parade grounds to show students this original area of the former Fort. Supplementary in-class activities about the Fort’s history can also be obtained for free from the Lake County Forest Preserve District at http://www.lcfpd.org/fort_sheridan/?rdct=ExploreTheFort.org. See the map with written directions in the Appendices for additional driving instructions if this option is desired.

Contact Information

Your primary contact for Eco-Explorations is:

John Cawood, Education Program Coordinator
Openlands
25 E. Washington, Suite 1650
Chicago, IL 60602
312-863-6276 (office)
jcawood@openlands.org

Teacher materials are available for download at:
**Before Each On-Site Visit**

In order to ensure the Eco-Explorations Program is a valuable and positive experience for students, teachers hold some responsibilities for preparing the students for their visits to the Preserve and helping them to synthesize their experiences afterwards. The checklist below clarifies the pre-visit responsibilities of each participating teacher; these are also described in the Memorandum of Understanding (MOU). See the Appendices for the MOU form.

- **Complete the Pre-Visit Lesson in the Classroom**
  The pre-visit lesson for the appropriate season (autumn or spring) should be completed in the classroom at least one week in advance of the corresponding visit to the Preserve. See the Curriculum section, starting on page 10.

- **Request Parent Chaperones**
  We support our educators with chaperones to assist with passing out materials, keeping students on track, and leading small groups of students for individual activities. We require one adult chaperone per ten students.

  It is the responsibility of the teacher to seek an adequate number of these chaperones for the size of the classroom, prior to each visit to the Preserve. Openlands does have some volunteer chaperones available to supplement parent chaperones. Teachers must notify Openlands staff at least one week prior to the visit if they require additional chaperones. We have put together a quick reference guide for chaperones which is included in the Appendices. *Please distribute this guide to all chaperones about a week prior to the on-site visit.*

- **Notify Openlands of Any Special Needs**
  Teachers should notify Openlands staff prior to each visit to the Preserve if any students require special needs assistance. We will do our best to accommodate these situations.

- **Have Student Photo Release Forms Signed**
  Openlands reserves the right to take photographs of each class during their on-site visits, unless a parent or guardian has specifically stated they do not wish their child to be photographed. A photo release form is included in the Appendices, and may be copied as needed. Please distribute these forms to students prior to the autumn on-site visit so that they may be signed by parents. The completed forms should be brought with on the day of the visit to the Preserve and given to the educator for our records.

- **What to Bring**
  - **Weather-appropriate clothing:** Changeable weather conditions can occur quickly along Lake Michigan. Teachers and chaperones should dress for the weather. Consider reminding students and/or parents of the forecast before each visit to the Preserve. Often hats, gloves, coats, or rainjackets are a must, especially in the autumn. Inadequate clothing can make it difficult for students to concentrate on the program or enjoy their nature experience.
  - **Sun and/or insect protection:** According to individual requirements. Teachers and parent chaperones should consider if there are bee sting allergies among themselves or students and make appropriate arrangements for bringing necessary medications, per the school’s policy and procedures.
• **Backpacks and Lunch**: Students should bring a sack lunch and a backpack for carrying their lunch during the visit. Please note that drinking water is not available at the Preserve. We ask that students leave their lunches in their backpacks until the designated lunch break, so they can concentrate on the program activities.

• **Trash Bag**: Teachers may bring a trash bag to collect debris from student lunches, or have students carry all trash from their individual lunches out in their backpacks. The trash may be taken back to the school for disposal or discarded in one of the receptacles at the Preserve, located near the bus pick-up and drop-off location.

All other items for each visit to the Preserve are provided by Openlands, including journals, pencils, and activity materials.

Please note that the journals are designed to be used in the autumn and then again in the spring. For your convenience, the journals include sections that can be used to write in during the pre- and post-visit lessons. Teachers are responsible for collecting the journals after the autumn visit to the Preserve and saving them for use in the spring visit. After the spring visit, the students can keep the journals.

✔ **Cancellations Due to Inclement Weather**

Due to budget and seasonal restrictions, we will not cancel a visit to the Preserve unless seriously inclement weather poses a significant safety risk or overly negative impact on the student experience. Therefore, teachers should plan for visits to take place even in lightly rainy or chilly conditions. As previously mentioned, teachers should emphasize to students and/or parents the importance of wearing appropriate clothing for a 3-hour period of time spent outdoors in a variety of potential weather conditions.

Weather conditions that would result in a cancellation include severe thunderstorms, moderate to heavy persistent rain, or severe heat or cold. Openlands staff monitors the weather prior to each on-site visit and will contact you if a cancellation is needed. **Contact John Cawood at 312-863-6276 if you need to confirm a cancellation or have questions about weather conditions.**

Any cancelled visits to the Preserve must be rescheduled within a maximum of two weeks of the original date. Openlands staff will work directly with teachers to reschedule.

**After Each On-Site Visit**

✔ **Complete the Post-Visit Lesson in the Classroom**

The postvisit lesson for the appropriate season (autumn or spring) should be implemented in the classroom within one week after the corresponding visit to the Preserve. See the Curriculum section, starting on page 10.

✔ **Complete the Post-Visit Survey**

Teacher feedback is a critical component of the Eco-Explorations program, and it allows us to continue to improve the experience for students, teachers, and chaperones. Shortly after each on-site visit during the school year, teachers will receive an emailed link to a brief online survey about their experience. Surveys should be completed within two weeks of receiving the link. Additional comments or suggestions may be submitted at any time to Openlands staff via phone or email.
Talking about ravine geology during an autumn Eco-Explorations visit to the Preserve
Overview

- Grade Level: 3-4
- Time Needed: 30-45 minutes

Below is a list of important words for your students to become familiar with before visiting the Openlands Lakeshore Preserve for the autumn and spring visits. These words may be used by the educator during the on-site activities. This extension activity should be done before each pre-visit lesson. Student knowledge of the vocabulary words on this list can also be used as an assessment tool for the post-visit lessons.

Please note that the words in this list have been keyed to indicate which portion of the Eco-Explorations program they apply to, as follows:

- Autumn visit (A)
- Spring visit (S)
- Both visits (A, S)

Procedures

For those teachers who use "word walls" and want to make this learning experience more interdisciplinary, have students match the words below with definitions on a large board. Magnets or laminated words could be used to make word definition cards for the board.

Alternately, you can invite the students to share ideas for learning the vocabulary. Perhaps they could create a jingle or write a story. Have fun!

For additional extensive lesson plans on the history of Fort Sheridan, visit Lake County Forest Preserve District at www.lcfpd.org/fort_sheridan/fs_curriculum.cfm.

Vocabulary List

**Abiotic:** Non-living environmental factors, such as water, light, temperature and nutrients. (A)

**Biotic:** All living organisms in an ecosystem, such as plants and animals. (S)

**Bluff:** A high, steep bank often formed by river erosion. The 80-foot tall bluffs at the Openlands Lakeshore Preserve were formed by glaciers and changing water levels in Lake Michigan. (A, S)

**Clay Soil:** Soil containing a large proportion of clay particles, typically along with some organic matter, silt, and a minimal amount of sand. Clay particles are smaller than sand and clay particles, are shaped like discs, and are sticky when wet and hard when dry. (A)

**Climate:** The average weather usually taken over a 30-year period (long-term) for a particular region and time period (note that “climate” is not the same as “weather”). (A, S)
**Ecosystem:** A community of plants and animals living in the same physical environment. (A, S)

**Endangered Species:** Any species of a plant or an animal threatened to survive or reproduce for various reasons and are considered to be at risk of extinction. (A)

**Environmental Stewards:** A group of people who are personally responsible for and dedicated to taking care of environmental landscapes, plants, and/or wildlife in a specific ecosystem. (A, S)

**Erosion:** The process of displacing solids (rock, sediment, brush) by forces of wind, water or ice. (A)

**Geologist:** A person who studies rocks. (A)

**Habitat:** The living space of an organism or community, characterized by its physical and/or biotic factors; an animal’s habitat is made up of food, water, shelter and a required amount of space per organism. (S)

**Hypothesis:** An educated guess about why something happens; part of the scientific method. (A, S)

**Invasive Plants:** Specific plants which are introduced species that can thrive in areas beyond their natural range of dispersal. They are highly adaptable, aggressive, and have a high reproductive capacity because they typically lack predators. (S)

**Mulch:** Any material used to cover the surface of soil; can be natural (compost, wood bark, hay, straw, pine needles) or synthetic (paper or plastic). Mulch is used to protect plant roots from extreme temperature changes and can also control weeds. (A)

**Native:** Plants that grow naturally in a certain area and developed over time within the local ecosystem(s). (S)

**Non-Native:** Plant species that occur outside their native ranges in a given place, generally as a result of actions by humans. Scientists may use similar words such as “exotic” or “non-indigenous” in the same way as the word “non-native.” (S)

**Observation:** When a person gains knowledge from his or her surroundings through their senses; can also refer to when information is collected and recorded with scientific instruments. (A, S)

**Organism:** An individual form of life, such as a plant, animal, bacterium, protist, or fungus. (S)

**Parent Material:** Bottom layer of soil that is typically found about three feet below the topsoil, and is generally filled with stones and rock layers. (A)

**Ravine:** A long, deep cut-out in the earth, usually eroded by a stream or other water source. At the Openlands Lakeshore Preserve, the ravines were formed by the movement of glaciers about 15,000 years ago. (A, S)

**Roots:** Parts of a plant that absorb water and nutrients from the soil, anchor the plant in the ground, and can provide storage for sugars (food) produced by the plant. (A, S)

**Restoration:** An act of reconstructing an ecosystem and returning the area’s condition to what is thought to be a former, unimpaired state. (A, S)
Sandy Soil: Soil containing a large proportion of sand particles; it feels gritty and the sand allows water and air to move through this soil type quickly. Sand particles are the largest size when compared to silt and clay particles, and are granular in shape. (A)

Silty Soil: Soil containing a large proportion of silt particles; it can feel like flour when dry or feel very moist when wet. Silt particles are medium sized when compared to sand and clay particles, and are often blocky in structure. (A)

Scientific Method: A method of inquiry that scientists use to investigate things they want to understand. The scientific method includes the following: making observations, formulating hypotheses, gathering and recording data, and making conclusions. (A, S)

Subsoil: Soil layer that is typically found about one foot below the topsoil, and is home to tree roots, earthworms, and other underground organisms or parts of organisms that grow above the ground. (A)

Topsoil: Uppermost layer of soil where plants grow; typically has a high concentration of organic matter. (A)

Weather: Describes the short-term state of the atmosphere, such as temperature, cloud cover, precipitation, and air pressure (note that “weather” is not the same as “climate”). (A, S)

Acknowledgements
This lesson was written by Julyne Segar, contracted Curriculum Specialist for Openlands.

Autumn Pre-Visit Lesson: What is Erosion?
Overview
- Grade Level: 3-4
- Time Needed: 60 minutes

Debra Ruff, Education Coordinator at Livingston County Soil and Water Conservation District, provided permission to adapt their original lesson into this version for the Openlands Lakeshore Preserve.

This interdisciplinary activity should be done in the classroom at least one week prior to the autumn visit to the Openlands Lakeshore Preserve. Students will investigate soil and erosion by using the scientific method, building an erosion model, utilizing math skills, and developing communication and team-building skills.

The Eco-Explorations Vocabulary List supplements lessons to help students prepare for their visit. Words from the vocabulary list are indicated in bold text throughout this lesson. An illustrative excerpt from the Illinois Ag Mag “Soil” edition is also provided at the end of this lesson to assist in the activity.

Teachers are encouraged to modify this activity as needed for the grade level. For example, a disposable aluminum turkey roasting pan can be used instead of bottles when building the erosion models, in order to demonstrate erosion on a larger visual scale than the bottles. Invite students to think of creative ways to use recycled products and reuse items for the activity.

Curriculum standards met by this lesson are listed below. Please see the Curriculum Standards Chart in the Appendix of the Elementary Program Guide for more information.
- Next Generation Science Standards Performance Expectations: 4-ESS2-1 and 4-ESS2-2
- English Language Arts Common Core Standards: SL.3.4, L.3.4, L.3.4d, W.3.8, SL.4.4, L.4.4, L.4.4d, W.4.8
- Math Common Core Standards: 3.MD.B.4

Objectives
After making an erosion model, students will be able to:
- Make and test hypotheses
- Record observations, interpret data, and arrive at conclusions
- Explain how plants and mulch can help prevent erosion
- Describe how plant roots effect soil erosion
- Comprehend that erosion can happen naturally in an ecosystem

Materials Needed
- 3 20-fl.oz empty plastic bottles for each group. Ask each student to bring one from home to reuse.
- 1 quart size bag of topsoil (not potting soil). You will need about 30 cups for a class.
- 1 quart size bag of mulch (such as tree mulch, hay, or straw)
- 20 small pieces of grassy sod for each group (2” x 2” in size)
- 1½ cups of water for each group (1/2 cup used per experiment)
- 3 clear plastic cups for each group
- Scissors for each group
- Permanent markers for each group
- Measuring cups or cylinders
- Tape measures
- Box, tray, or container to put experiment supplies in for each group
- Pencils and an observation chart to record data. Students may also use notebooks or blank sheets of paper
to record. See the Preparation section for help in designing your own observation chart.

- Optional items: Disposable aluminum turkey pan to build a larger scale model; samples of sand, silt, and clay in small cups for each group; small fan to represent wind erosion; small figurines, if using the turkey pan option, to help illustrate erosion.

**Background**

What is soil made of? Draw a pie chart on the board and divide it as follows: 45% of soil is made up of mineral matter (sand, silt and/or clay), 25% is water, 25% is air and 5% is organic matter (humus).

**Sandy soil** is mostly sand and it feels gritty and allows water and air to move through it quickly. Sand is the biggest sized particle and is granular in shape. **Silty soil** can feel like flour when dry or feel very moist when wet. Silt particles are often blocky in structure. **Clay soil** has mostly clay particles, some organic matter, silt, and minimal sand. Clay particles are the smallest particle of the three soil types. These are shaped like discs and are sticky when wet and hard when dry.

Soil has three layers: the **topsoil** (where the plants grow), the **subsoil layer** (approximately one foot below the surface where tree roots and earthworms live), and the **parent material** (bottom layer with stones and rock layers three feet below the surface). Living or dead plants, decaying debris, and mulch can all help prevent erosion of the upper layers of soil in an ecosystem.

Here are some important questions to ask your students during the activity:

- What is erosion?
- What happens to our land if it rains too much?
- What happens to our land over a long period of time?
- What is the function of plant roots?
- How can we help prevent erosion damage?

**Preparation**

- This series of experiments is best done in groups of three and is based on a class size of 30 students, or ten groups. You can use one set of three bottles for each group, or you may wish to have students make their own individual erosion models. Alternatively, you can build models in disposable turkey pans – one for each group.
- You can pre-cut the 20 small pieces of sod from the schoolyard or from home to use for the experiments. Alternatively, the students can measure the sod and cut it out during class time. Each piece of sod should show some root structure.
- Gather all of the materials in a box or on a tray for each group of three students. Each box should have the following materials: three plastic bottles, 3 plastic cups, scissors, permanent marker, tape measure, and measuring cup. Also include one cup of topsoil, two pieces of grass sod, and one handful to one cup of mulch. Alternatively, use one disposable turkey pan for each group in place of the bottles.
- The plastic bottles should be clear and clean so that observations can be easily made.
- Construct an example erosion model from the instructions below before the class, so you can show the students what they will be creating.
- We have left the option up to teachers to create their own individual observation chart template, if desired. The chart will ideally have three columns where students can plot their hypotheses about how much water and soil will be captured in each experiment. Alternatively, students can use notebooks or blank sheets of paper to record their data during the activity.
Procedures
1. What do your students know already? Review the *scientific method* with students so that they understand exactly what they are doing for each experiment. Explain parts of soil makeup and introduce sand, silt and clay soils and particles. Using the pie chart described in the Preparation section of this lesson can be a useful visual tool for teaching the concept of soil makeup. Another option is to have students feel the three types of soil to get an idea of the texture, size, and weight of different soil types. Also review the function of plant *roots*. Explain that roots absorb water and nutrients from the soil and hold a plant in the ground, like an anchor.

2. Introduce vocabulary highlighted in bold from this lesson and the definitions for those words from the Eco-Explorations Vocabulary List Extension Activity. What is *erosion*? Make a list of definitions on the board.

3. Inform the students they will simulate erosion by making a model. Show a completed erosion model to the class before you distribute the materials.

4. Distribute a box of materials to each group. The group should work as a team to construct the models, with the teacher’s guidance. See illustration at right to assist students with measuring and cutting the bottles. Adult supervision and assistance may be necessary for this step, and you may wish to have the students measure the bottles and do the cutting yourself. Alternatively, show each group how to build a model in a disposable turkey pan. To do this, simply layer soil, sod, and mulch the same way as in the bottles. You may wish to add small figurines to help simulate a landscape.

5. Students will do three experiments (requiring one bottle per experiment, per group). These include: 1) water with soil, 2) water with soil and sod, and 3) water with soil, sod, and mulch. Before they conduct each experiment, have each group make a hypothesis about what will happen. Each group should write their hypotheses on their observation chart or in their notebooks.

6. Have students measure one cup of topsoil and add it to the first bottle. Have one student represent a slope or hill by tilting the bottle at a 45 degree angle (making sure the second student in the group holds the cup under the top of the bottle to catch the water and soil runoff). The third student represents rain and will saturate the soil by pouring ½ cup of water into the top of the bottle’s opening. Have students watch what happens. They should observe erosion taking place. Where is the water going? What is happening to the soil particles? Have students record their data on the observation chart or in their notebooks. The group should then measure the amount of water and soil captured in the cup, and record that data as well.

7. Now have one student in the group add another cup of soil to the second bottle. Place a piece (or pieces) of the precut sod on top of the soil in the second bottle. Once again, have students make predictions about what will happen to the soil and the water and record their observations. Tilt the bottle at a 45 degree angle and repeat the process as before, adding ½ cup of water and recording how much water and soil is captured in the cup. What happens to the water if there is a lot of sod on a hill? What happens to the soil? Some of the water will get absorbed into the roots of the grass and hold the soil in place.

8. Lastly, add the final cup of soil to the third empty bottle. Have one student place another piece of sod and
a handful of mulch into the bottle. Lightly pack the mulch down in the bottle. Repeat the process: the first student will tilt the bottle at a 45 degree angle, the second student will pour ½ cup of water in the bottle, and the third student will hold the cup underneath to capture the water and soil runoff. Have students observe what happens to the soil and water and measure how much is captured in the cup. Is there a lot of water "run-off" occurring? What color is the water that has been captured? How does that color compare to water captured in the previous two experiments? What do you think this tells us about how mulch and sod function in an ecosystem to prevent erosion?

9. Have the students compare the results from each experiment as recorded on the observation chart or in their notebooks.

10. Invite each group to share and review their results with the class. The students should come to the conclusion that the grass and mulch combination is the best choice to hold the soil in place. Explain to the students why it is so important to add mulch to vegetated areas, such as farmland. It takes over 500 years to make new soil, and just minutes for unprotected topsoil to erode forever! Emphasize that we need to become aware of how valuable a resource soil really is, and that we all need to become environmental stewards so we can protect resources like soil that are critical for future generations.

Extensions

- Have students conduct an additional experiment with wind conditions by using a fan on bare soil. Students should record their hypotheses and observations on the observation chart or in their notebooks.
- Make a “mud shake” to see how different layers of soil types function in comparison to each other. Use a glass container with a lid, add some water, and place a different soil sample in each container. Look at the layers created by the different soil particles. Measure and record the students’ observations.
- Research the life of a farmer. Visit outdoor landscapes that have visible and varied examples of erosion taking place.
- Explore the prairie ecosystem and its extensive root system that prevents erosion. Learn more about how and why the pioneers built sod homes.

Assessment

- Ask students to describe how erosion affects land.
- Ask students to list the steps of the scientific method.

Resources

- Agriculture in the Classroom: Lesson plans and magazines. www.agintheclassroom.org
- Chicago Environmental Network: Learn more about regional conservation groups and the important conservation work they are doing. www.chicagoenvironment.org
- Chicago Mighty Acorns Stewardship Program: Education programs and lessons about local ecosystems and stewardship. www.mightyacorns.org
- Chicago Wilderness: A regional collaboration promoting conservation and education in Chicagoland; their website has lots of information about initiatives that can be used in the classroom. www.chicagowilderness.org
- Cook County Farm Bureau: Locally-themed lessons on soil and agriculture. www.cookcfb.org
Illinois Department of Natural Resources (IDNR): Free posters and activity books. [www.dnr.state.il.us](http://www.dnr.state.il.us)


North American Association for Environmental Education (NAAEE): Lessons about all kinds of different topics in conservation, teacher resources, and more. [www.eelink.net](http://www.eelink.net)


Acknowledgements
This lesson was written by Julyne Segar, contracted Curriculum Specialist for Openlands.
Why is Soil Important?

Preserving our Earth’s soil.

Everyone must take an active role in improving and maintaining our precious planet. We need to keep our drinking water clean and protect our soil from pollution. Our soil is more than just dirt; it is a living ecosystem that supports life. It provides us with food, clean air, and clean water. Soil is home to many different types of organisms, including plants, animals, insects, and microorganisms. Soils also help preserve soil. We build

Back to the Soil!

An agricultural magazine for kids
Openlands Lakeshore Preserve Eco-Explorations Elementary Program Guide – Grades 3-4

Page 19

Soil Parts

- Organic Matter: 5%
- Alkali: 25%
- Water: 25%
- Mineral Matter: 45%

These parts of soil absorb and hold water and nutrients, which are essential for plant growth.

In the diagram, you can see the different components of soil. The organic matter is shown in green, the alkali in blue, water in blue, and mineral matter in yellow.

Even dead plants help prevent soil erosion. In the past, farmers plowed their fields after harvesting to mix the plant stems and leaves with the soil. Today, many farmers use cover crops, which are plowed under to help prevent soil erosion and add nutrients to the soil.

On the Farm

Soil erosion is the process of soil loss caused by water, wind, and other natural forces. If you were to look at a farming field, you would see that the soil has been compacted by the plow and the weather has caused it to erode.

The diagram in the book shows the different components of soil and how they interact with each other. The organic matter is shown in green, the alkali in blue, water in blue, and mineral matter in yellow.

Al Home

When you come home after a hard day’s work, you will find your home full of life. The soil is vital to the health and survival of plants and animals.

Plants Keep It In Place
Soil has three layers.

1. Topsoil - Here is where the plants grow. Wind or water erosion can wash away this valuable soil. Most nutrients, organisms, and roots are in this layer. Layer III farmers don’t produce it. In fact, it takes nature over 500 years to replace one-inch of soil.

2. Subsoil Layer - This layer is about one foot below the surface. Decayed roots and earthworms live here.

3. Parent Material - This is the bottom layer. About three feet below the surface in the Midwest. It’s more compact and often has stones and rocks in it.

Agriculture is used for 30 million acres more than the soil.

Farmers help keep the soil healthy.
Autumn Post-Visit Lesson: Naturalist’s Journal

Overview
- Grade Level: 3-4
- Time Needed: 45-60 minutes

This interdisciplinary lesson should be done in the classroom within one week after the autumn on-site visit to the Openlands Lakeshore Preserve, in order to provide a quality reflection on the experience.

The activity highlights two famous naturalists, John Muir and Aldo Leopold (Leopold is actually referenced in the interpretive elements found at the Preserve). The lesson integrates literacy connections and science concepts using the Eco-Explorations student journals. The students’ journal entries can be used as an assessment tool to identify what students learned at the Preserve during their visit. Refer to the Eco-Explorations Vocabulary List Extension Activity to help students with this lesson.

Curriculum standards met by this lesson are listed below. Please see the Curriculum Standards Chart in the Appendix of the Elementary Program Guide for more information.
- Next Generation Science Standards Performance Expectations: 3-ESS2-1 and 4-ESS3-2

Objectives
After completing this lesson, students will be able to:
- Describe what a naturalist does
- Name a famous naturalist
- Reflect upon their experiences and what they learned at the Preserve during their autumn on-site visit

Materials Needed
- Pencils, markers, crayons, and/or colored pencils
- Eco-Explorations student journals
- Resources (books, quotes, journals, etc.) on famous naturalists

Background
Historically, ecologists, naturalists, and explorers used to (and still do!) wrote daily journal entries to document what they saw. Being able to make observations is an essential skill for naturalists, and so is the process of recording information about these observations. For example, scientists of the past wrote essays or journal entries and drew illustrations to help them document historical events or investigate their discoveries in botany and zoology.

Students had the opportunity to role-play as naturalists during their autumn visit to the Preserve. Discuss what senses the students used during the visit, before beginning the journaling activity. Below are descriptions of two famous naturalists that can be highlighted as part of the lesson:
• **John Muir** was born on April 21, 1838 in Dubar, Scotland, and moved to the United States in 1849. Muir attended the University of Wisconsin and was an advocate for the creation of Yosemite National Park in California. He died on December 24, 1914 at the age of 76. Muir was best known as a naturalist, co-founder of the Sierra Club, and “the father of the National Parks system.” There are inspirational writings from his books *My First Summer in the Sierra*, *The Cruise of the Corwin*, or *Cedar Keys* that might be appropriate to read to the students. “John Muir Day” is officially celebrated on April 21st. This is an important day to recognize the significant role Muir played in the conservation movement.

• **Aldo Leopold** was born on January 11, 1887 near Burlington, Iowa. He studied at Yale where he received a degree in forestry. Leopold taught at the University of Wisconsin from 1928 until his death in 1948 at the age of 61. He purchased farmland near Baraboo, Wisconsin, where he built a small writing cabin which was later referred to as “the Shack.” Leopold was a talented writer; his famous book, *A Sand County Almanac*, reflects upon his passion for observing and recording nature events. This book is read during elementary school throughout Japan as a notable American work. Leopold is often referred to as the “father of restoration ecology.” Openlands has recognized Leopold’s important contributions to the conservation movement by incorporating some of his quotes into the design of the upland trail overlook at Van Horne Ravine. While this location is not on the Eco-Explorations program route, it may be of interest to students and teachers for return visits to the Preserve on their own.

**Preparation**

- Locate books from the library or from the Resources section to help support the activity.
- Pass out the students’ Eco-Explorations journals from the autumn on-site visit.
- Having a peaceful ambiance in the classroom for this lesson helps the students reflect. The activity could be done outdoors, such as in the schoolyard or a school garden space.

**Procedures**

1. Encourage students to reflect upon their Preserve experience as part of quiet time in the classroom. Have the students close their eyes and use their imagination when you read the selected stories or journal entries. Read a portion of a naturalist’s journal, such as the essays of John Muir or Aldo Leopold, aloud to your students.

2. Show them any sketches that may accompany these naturalist essays. Optionally, you could have your students do a research project to find famous quotes by Leopold or Muir.

3. Invite students to discuss the naturalists’ journal or essays. How might the entries be similar or different from the students’ own Eco-Explorations journals? Do their journals have similar drawings of animals or plants? What did the land in the United States look like in the 1800’s or 1900’s? Is it the same or different as today? What was the weather like on the day of your visit (refer to the weather data chart in the journals if students cannot recall)? Students can also do research on what the climate was like 30-100 years ago around Fort Sheridan, in Highland Park, and in Highwood, in order to make comparisons with the weather data they collected during their visit to the Preserve.

4. Do the students have a perception that people are abusing or destroying natural ecosystems? Do they have a new appreciation for land and the Preserve after their autumn on-site visit? What might they want to do to help keep the Preserve healthy in the future? Encourage students to find solutions or strategies to help guide this activity for discussion as a class or in small groups. Students can contribute to a list of ideas that can be displayed on a large board in front of the class.
5. Next, the students will use their journals for a writing exercise. Use the date of the autumn visit to the Preserve as a prompt.

6. Have students turn to pages 12-13 and write their journal entries by creating a personal story using descriptive details. Encourage students to include their collected weather data into the story. Example: “Today I walked through the Preserve and saw many colorful plants and a few animals. It was a very hot and sunny day (80 degrees) in the ravine, but when we arrived at the lakeshore it was windy and cool. It also rained on us. I heard a bird that was very loud. It may have been a woodpecker pecking its beak on a tree...” Encourage your students to be as detailed in their journal writing as possible. Based on your grade level, tell your class how many paragraphs or pages they should be writing.

7. Prompt students to use any vocabulary words they learned in the autumn pre-visit lesson or heard the educator use during the visit to the Preserve. Use the Eco-Explorations Vocabulary List Extension Activity to help the students recall the words they learned, and choose which ones to use in their journaling.

8. Students may want to add drawings to their stories to further describe what they observed from a naturalist’s perspective during their visit. Encourage students to be creative in their documentation. Ask students if they liked being a naturalist for the day! Will they observe nature differently next time they visit a park, beach, or open space area?

9. Collect the journals for review.

Extensions
- Invite students to share their stories by reading them out loud or performing them in a one-person or small group skit at the end of the class time.
- Make copies of the journal entries. Display the journal entries on a bulletin board or on a table for school administrators or parents to see at a school event. Include pictures of your naturalists, if available.
- Research other famous naturalists and find famous quotes or journal entries. Encourage a debate or group discussion on how and why quotes from famous people leave an impact on others for eternity.

Assessment
- Ask students to name three facts or concepts illustrated in their journals that they learned during their autumn on-site visit to the Preserve.
- Ask students to state one significant contribution of John Muir or Aldo Leopold to the conservation movement.
- Ask the students to explain the importance of journaling for scientists.
- Ask students to explain how the weather impacts erosion at the Preserve.

Resources
- For extensive information on Aldo Leopold, including a great fact sheet and bibliography, visit http://www.aldoleopold.org.
• For extensive information on John Muir, including a great fact sheet and bibliography, visit http://www.sierraclub.org/john_muir_exhibit/.

Acknowledgements
This lesson was written by Julyne Segar, contracted Curriculum Specialist for Openlands.
Summary
Through this experience, participants become acquainted with the Openlands Lakeshore Preserve as a “learning landscape.” Students work together in small groups, each led by a chaperone, to explore the three microclimates of the Preserve: the ravine, lakeshore, and the bluffs. Students use a journal to practice questioning, observation, and data collection.

Total Time for visit: 3 hours

Objectives
By observing their surroundings and using a nature journal to record their experiences, students will:
- Investigate the non-living aspects of the Openlands Lakeshore Preserve and how those factors affect the site’s ecosystems;
- Practice using the scientific method and critical thinking through observation
- Learn about the effects of water on erosion and the Preserve’s topography and ecology; and
- Gain knowledge of the three key concepts.

Key concepts
- At the Preserve, water and wind constantly affect erosion in the three ecosystems that make up the site’s landscape, including the ravines, the lakeshore, and the bluffs.
- Naturalists observe nature and record their experiences and conclusions in journals.
- Finding a sense of place, using observation skills including the five senses, and journaling help to build connections between people, culture, and the land.

Standards
- Next Generation Science Standards Performance Expectations: 3-ESS2-1, 4-ESS2-1, 4-ESS3-2
- English Language Arts Common Core Standards: SL.3.4, L3.4, W.3.8, SL.4.4, L.4.4, W.4.8
- Math Common Core Standards: 3.MD.B.4

Logistics
Educator should pick up the backpacks of supplies, prior to the bus arrival, at the Openlands Satellite Office (445 Sheridan Road, Second Floor Center, Highwood, IL 60040). Educator is responsible for restocking the bags after each visit from the green plastic bin marked “Eco-Explorations.” Chaperone directions are highlighted in yellow throughout this script.

Bus Arrival: Arrive at the Midwest Young Artists Building after 9:30 a.m.
Program Start Time: Between 9:45-10:00 a.m.
Program End Time: 1:00 p.m.
Bus Departure: Leave the Midwest Young Artists Building between 1:00-1:30 p.m.
Students Per Visit: 35 students maximum
## Autumn On-Site Visit Outline

### 1.) Midwest Young Artists Building: Welcome and Orientation (20 minutes)
- **Bus arrives.** Educator greets the class and helps unload the bus.
- **Restroom break.** Chaperones can help gather students in the lounge after their restroom break.
- **Educator facilitates orientation and group breakout**
  - Educator introduces him/herself and welcomes the class.
  - Describe the building’s history: “This unique building was built in 1890 and was a former jail which held 72-120 prisoners when Fort Sheridan was an active Army base. It is now a music school.”
  - Introduce chaperones. Chaperones should have been pre-oriented with the “Chaperone Guide” handout included in the Appendix of the Elementary Program Guide.
  - Break up students into six small groups, each with their own chaperone leader. Chaperones must stay with their group throughout the entire program.
- **Distribute materials and lunches**
  - Educator and chaperones will distribute nametags, journals, pencils, and binoculars to students. Consider using color coding or small stickers on nametags to help define small groups. Each student should write their name on the back of their journal.
  - Students should carry their own lunches in their backpacks. Alternatively, the teacher or chaperones can carry the lunches for the students. Note that all garbage must be collected by the teacher and packed out for disposal in the parking lot receptacles or back at the school.
- **Travel to the Preserve.** Educator will assist in loading bus and will ride on bus to direct driver to the Preserve’s Patten Road parking lot. Educator will bring the supply backpack(s) on the bus.

### 2.) Preserve Parking Lot: Drop off (5 minutes)
- **Bus drop off.** Before getting off the bus, the teacher should announce to students that we will get started by gathering on the concrete area at the top of the ravine stairs. Students should keep to the sidewalk and with the group, and make sure to stay out of the street while exiting the bus.
- **Bus parking.** Bus may park at MYA parking lot or on the west side of Patten Rd, south of the Preserve Parking lot.

### 3.) Under Arc of Nature Bridge: Introduction, Ice Breaker, and Weather Data Collection (20 minutes)
- **Sit under bridge.** Have groups sit in a circle under the bridge, making space for Preserve users to pass by safely.
- **Pass the Cardinal.** Each student takes turns holding the stuffed Northern cardinal. “everyone say your name and one thing you like about nature. Then, pass the bird on to the next person.”
- **Rules.** “While you are here today, I am going to ask you to follow a few rules to ensure that you are safe at all times during your visit.”
  - Please walk at all times.
  - Please stay with your group and on the paths at all times.
  - Please leave the plants and rocks how and where you find them.
  - Please write down questions in your journal for discussion later.
  - Please walk behind the Educator.
- **Explain to students that this will be the only time that they sit and listen for a lengthy period of time. After this, they will be walking, observing, and collecting data. There are just a few things they need to know before going any further.”
- **Educator gives background on Openlands and the Preserve.** “We are in the Openlands Lakeshore Preserve. Openlands protects natural areas and open spaces in the Chicago area, like forest preserves, parks, the Midewin Tall Grass prairie, and the Indiana Dunes. We also helped with the gardens at your school. Openlands helps to bring people to these areas so they can connect with nature. We own and maintains this park, but anyone can come here on their own for free.”

- **Clicker.** Educator will demonstrate the clicker and inform the students to pay attention: “Please listen carefully for the attention-getting device. When you hear the noise, it’s time to listen for instructions.”

- **Welcome to Bartlett Ravine.** Educator will tell the story of Bartlett Ravine using one of the following:
  - Option #1: Play podcast excerpt on a portable speaker device. The podcast is 3 minutes, 45 seconds in length.
  - Option #2: Tell the story instead: “Over 12,000 years ago, the land that we are standing on right now was covered with a huge, thick sheet of ice. When the climate became warmer, all of that ice began to melt. Over many thousands of years, the water from that melting ice rushed over the land, eroding the soil and rocks and causing deep channels to form in the landscape. These channels, or cut-outs in the earth, are called ravines, and right now we are sitting inside a ravine called Bartlett Ravine. There are only about 35 ravines in the state of Illinois, so these are rare and special places.”
  - After the story is completed, Educator will reinforce the central message of this stop: “So, again, a ravine is a cut-out made in the earth made by running water.”

- **Naturalist Tools**
  - Educator explains that students will be naturalists today.
    - Ask students what they think a naturalist studies?
    - “A naturalist is a person who used their powers of observation to learn about and understand nature. Naturalists like to use simple, portable tools to help them collect information, also called data.
    - Educator will put on the naturalist prop hat: “I am going to put on my naturalist hat to help me do some observations. You can have a pretend naturalist hat too to help you observe. Let’s all put our hats on and look around the landscape.”
    - Educator should ask the students: “What do you see?” Educator should solicit answers from students. Possible answers include trees, plants, squirrels, birds, rocks, etc.
  - Practice how to use binoculars and compasses
    - To use binoculars look through the small end; show students how to use the dial to focus their vision (if applicable)
    - Binoculars should be around their necks at all times.
    - Introduce directions, and practice using the compass: “How do we know which direction is north?” Educator should solicit answers from students. “That’s right, look for the red needle pointing to “N” for “north” on your compass.”
    - Educator should review “S” for “south,” “E” for “east,” and “W” for “west.” “We can also use the sun’s position in the sky to help us know what direction is east because the sun rises in the east and sets in the west.”
    - Test students for understanding: i.e. “Which way are we pointing now?”
  - Educator shows students the map of Preserve. Maps help us locate places and understand where we are. Do you know where we are right now?”
    - Use map to explain the route that they will walk through the Preserve, pointing out the three main areas where they will collect data, or information.
• Using the journals. Explain that the class will visit three distinct areas: the ravine, the lakeshore, and the bluffs, which are above the ravine and the lakeshore. In each area students will record observations and collect weather data.
  o Pages 4-7: As students walk with their group, they should write observations about the ravine and answer the questions on these pages
  o Last page of journal: Record weather observations
    ▪ Demonstrate how to collect weather data using a digital weather meter.
    ▪ Students to gather around and watch the meter. Chaperones can help students in their groups find the correct boxes on the table to write in their data.
    ▪ When the data is collected, Educator should wrap up the activity: “We will collect the same information at two other locations during our exploration today, so we can compare the information we collect. Great job recording your data!”
  o Students should know that they will use these journals again in class and during their Spring Visit. They should write their names on their journals and keep track of them the whole day.

4.) Arc of Nature: Erosion demonstration (5 minutes)
• Educator gathers students. Once all groups reach Leaf Prism, Educator will gather students together and asks each group to share an observation with this class. Chaperones should guide each of their students in sharing something quickly from their journals with the other students in their group; please try to make sure each student shares something.
• Reviews the concept of erosion. “Do you remember what erosion means? Do you remember the experiment you did with your teacher using the bottles and soil?” This discussion should be student-led as much as possible. Educator should solicit answers from students and see if they can define the word “erosion” and if they remember anything about the in-class pre-visit activity.
• Conduct the erosion demonstration.
  o Make a pile of sand or soil in the gutter. Add a twig to represent a tree and a plastic figure of a person or animal on the top of the pile.
  o Pour water over the pile from a bottle (from top to bottom) to show the effects of erosion.
  o Ask students to describe what is happening
  o Define erosion: “Erosion is the process of displacing/moving solids (like the soil) by the forces of wind, ice, or water (like the water I’m pouring right now).”
  o Connect demonstration to the pre-visit activity: “Think back to the bottle experiment you did in school. What happened when you added some grass to the soil? Did you see more or less water draining out of the bottle into your cup?” Solicit answers from students – the correct answer would be “less water.”
  o “Adding grass, or having grass growing on the ground, helps hold together the soil. What happened when you added the mulch to your bottle too? Was there a lot of water coming out of the bottle, or was it even less water than when it just had grass and soil?” Solicit answers from students – you may need to guide them in finding the correct answer, which is “mulch and grass added will cause the least amount of water to run off.”
  o “The more mulch and plants on the slopes in the ravine, the less water will erode the landscape when rain falls on the ground. The roots of the plants help anchor the plants down and keeps the soil from washing away.”
  o Ask students how erosion affects the ravine: “How would you prevent erosion in the ravine? Why do you think stopping erosion in the ravine would be important?” [Solicit answers from students – the correct answer is to plant more trees, grasses, and other plants to help hold the soil down, so the slopes of the ravine don’t collapse and wash away down into Lake Michigan].
• Educator will point out examples of erosion in the landscape nearby and reinforce key points: “This demonstration shows that when the weather is rainy and more water falls on the ground, there is more erosion occurring in the ravines.”

5.) Between Arc of Nature and Leaf Prism: Observation and sketching in small groups (30 minutes)

• **Walk down the ravine towards the lake in small groups.** Educator should select a location for each group along the way where they can stop and focus on recording in their journal on pages 4-7. Locations should be spread out enough that small groups are not disrupting each other.

  • **Chaperones should use the chaperone guide to help prompt the students on what they should be doing during this time.** Educator should direct chaperones to meet at the “Leaf prism in 20 minutes.” Students should be recording in their journals.

6.) Between Leaf Prism and Earthbark Prism: Observation and walk (5 minutes)

• **Walk down the ravine towards the lake as a class, but in small group clusters.**

• **Finish Ravine observations in journals.** This is a good point for students to finish pages 6-7. Additional observations can be recorded on pages 10-11.

  • **Chaperones should use the chaperone guide to help prompt the students on what they should be doing during this time.**

7.) Earthbark Prism: Transition to the Lakeshore (5 minutes)

• **Stop. Look. Listen.**
  
  o Educator asks students to share any other observations they made of the ravine.
  
  o Educator direct everyone to freeze in place and close their eyes, without saying a word, for 30 seconds.
  
  o After this time, students share their observations from this silent time, especially any new observations.

• **Introduce Lake Michigan.**
  
  o Educator asks students if they know what body of what body of what they are standing near.
  
  o Does anyone know if this lake is fresh water, like you can drink, or salt water, like an ocean?”
  
  o Fun facts that the Educator might share about the lake; Educator should consider sharing this information in question form:
    
    ▪ Lake Michigan borders four states (IL, IN, MI, WI).
    ▪ The average depth is 278 feet.
    ▪ The deepest point is 925 feet.
    ▪ It is home to many aquatic animals like fish, crayfish, mussels, and waterfowl.

• **Show erosion example, at the end of the road.** “Here is another example of erosion made by running storm water that comes down from the top of the ravine. The pressure from the fast running water made large cut-outs (holes) in the road.”

• Educator will guide the students to the grassy area in front of the Lake Prism art installation. Chaperones should keep their groups away from the water for safety purposes throughout all parts of the program that occur near the lake.

8.) Lake Prism: Weather data collection and lunch (30 minutes)

• **Collect Weather data.**
  
  o Direct students to the last page in the journal to record weather data.
  
  o Students to gather around and watch the meter. Chaperones can help students in their groups find the correct boxes on the table to write in their data.
• **Lunch at grassy area near Lake Prism.** Students can sit with their groups on the ground for lunch. In the event of rain or damp ground conditions, Educator can lead the class up the bluff stairs to the Elemental Matters overlook for the lunch break.
  o Educator should give class a two minute warning to wrap up lunch.
  o Teachers and/or chaperones must collect all lunch garbage in a bag and carry it out to the bus for disposal. Trash and recycling cans are located in the parking lot near the bus pick-up point.

  • **Students can use Journal pages 8-9: Relax and reflect at the Lakeshore.** If students finish lunch early, chaperones can lead their groups in the prompts listed in the journal, or in the activities below.
    o Share a story about a park or natural area you have visited.
    o Sketch the lakeshore using colored pencils.
    o Gather by Lake Prism to discuss water and the lake with the Educator.

  • Educator prepares for beach activities.
    o Notify chaperones that the next activity will take place on the beach.
    o Collect several buckets of water and place the full buckets on the beach where the next two activities will take place. Chaperones can help collect the water, if needed

9.) **Beach: Lakeshore Meets Bluff - Modeling Erosion (20 minutes)**

  • **Educator gathers students at Lake Prism.**
    o Instruct students to be cautious on the beach: “Please be careful walking on the beach, stay away from the water at all times, and be respectful of the plants and insects that live here.”
    o Reinforce the concept of erosion: “Sandy beaches are the result of erosion over a long period of time. We know that water causes erosion, but wind can pick up sand or soil particles and cause erosion too.” Educator should pick up a handful of sand and blow it away from the students to demonstrate windy conditions on the lakeshore.

  • **Demonstrate how to build an erosion model:**
    o Make two large sand piles and explain: “These piles of sand represent the bluff, which you can see behind us. The water in this bucket represents the water in the lake.”
    o Ask students what will happen when water reaches the sand: “Let’s make a prediction. What do you think is going to happen when I splash waves onto this bluff?” Solicit answers from students.
    o Demonstrate how to splash water from the bucket on one of the sand piles, towards the bottom of the pile. “Can you see how erosion eats the edge of the bluff away? This is how erosion occurs on the shoreline here at the Preserve.”
    o Demonstrate how wind affects shoreline erosion: “What do you think will happen when the conditions here are windy? Use a journal from your group to fan the bluff model. This will represent the wind.” Demonstrate fanning to the students. “Can you see what happens to the sand when there is a lot of wind?”

  • **Build Models in small groups**
    o Instruct students to build their own models: “Build your bluffs out of sand first, and then experiment with making wind and wave erosion just like I’ve shown you. You can also try to cause wind and water erosion at the same time. You will have about 15 minutes to do this activity.”
    o Assign a bucket of water and shovel to each group.
    o Chaperones should lead their groups in creating the erosion models and demonstrating the wind and water erosion. Each student in the group should get an opportunity to cause the erosion. It is the responsibility of chaperones to retrieve more water from the lake if the group runs out of water from their bucket. Students should stay away from the lake at all times.
• **Hand lenses (optional).** Once the erosion activity is completed, students can use the small hand lenses to make up-close inspections of the lakeshore environment. Chaperones can pass out and collect hand lenses for their group.

• **Observe Erosion on the Lake.** Once all students have completed the erosion model activity, Educator will wrap up: “Now we have seen the effects of erosion in the ravine and on the lakeshore. Do you see all of the large boulders piled up along the beach, and the plants that grow along the bottom edge of the bluff? These help slow down the erosion of the shoreline. The long metal jetties out in the water also help keep the sand from washing away.”

• **Collect all backpacks, gather group, and walk up the stairs to Elemental Matters.**

### 10.) Elemental Matters: Weather Data, Observations, Wrap up (20 minutes)

• **Collect Weather data.**
  - Direct students to the last page in the journal to record weather data.
  - Students to gather around and watch the meter. Chaperones can help students in their groups find the correct boxes on the table to write in their data.

• **Additional Observations.** Record other observations of the bluff area on pages 12-13.

• **Wrap up messages.** Educator thanks students for coming. “I hope you all enjoyed role-playing today as a naturalist and learned new observation skills that will help you be a better scientist! Thank you for exploring with me today – you were all awesome naturalists!”
  - Ask students if they can explain the erosion at the ravine, bluff, and lakeshore.
  - Remind students that they will be returning to the Preserve in the spring season: “I will see you next spring for your return visit to the Preserve. During that visit we will explore all of the living things that are found in the Preserve, like the plants and animal habitats.”
  - Encourage students to return with family and friends for a nature walk.

• **Return to the bus.**

### 11.) Parking Lot: Load Bus (5 minutes)

• **Collect materials and load bus.**
  - Chaperones should help Educator gather binoculars, colored pencils, and any other materials (except the student journals), and place them in the Educator’s backpacks. As each group’s materials are turned in, the chaperones can begin leading their groups back to the bus and loading the students onto the bus.
  - Educator should pack up the materials in the backpacks and follow the students to the bus when ready. Educator will ride with the class back to the Midwest Young Artists building, and should complete the daily log during the ride over.
  - Educator should remind teachers to gather their journals from the students so they can be used for the post-visit lesson and in the spring portion of the Eco-Explorations program.

• **Depart Preserve for MYA.**

### 12.) MYA: Final departure (15 minutes)

• **Restroom break.** Educator will help load and reload the bus for a second restroom break.

• **Thank you!** Educator should thank the teacher, chaperones, and students for coming, and see the bus off for its return to the school.

• **After class departs, Educator prepares for next visit.**
  - Scan the backpack for missing items and restock as needed for the next visit. Extra items are stored in the Openlands shed.
  - Email the completed daily log to Openlands within one week of the visit.
Indoor Extension Activities for Inclement Weather

These extensions may complete the final 1 to 1.5 hours of the visit if inclement weather requires the visit to be cut short. Indoor activities are designed to replace the “Lakeshore Meets Bluff” activity and include a discussion of the effects of erosion on the lakeshore, with writing and sketching exercises in the journals.

**Location:** Midwest Young Artists Building  
**Duration:** Replaces 1 to 1.5 hours of the outdoor program depending on weather conditions

1. Before leaving the site, Educator asks students to use their sense to observe the effects of water and wind erosion happening near the lakeshore and bluff area.

2. Educator will guide class back to the bus using the bluff staircase and upland trail. Educator will help load the bus, and bus will return to the Midwest Young Artists Building.

3. Educator will help unload the bus and guide students indoors. Students may take a restroom break prior to transitioning into the indoor extension activities. Students should sit in their small groups with their chaperones once inside the building.

4. **Optional:** If students still need to eat lunch, they may take 20-30 minutes to eat in the café dining area before starting activities. If inclement weather seems to be on its way before the bus arrives in the morning, Educator should check with the Midwest Young Artists staff to ensure the café area is available. Students can move to the lounge area after lunch to complete the activities.

5. Using a plastic-covered table in the café area, Educator and chaperones gather the students around the table for a brief demonstration.
   a. Lead a brief discussion of what students observed during the short time they spent on the lakeshore: “What do you remember seeing the most? Keep those thoughts in your head for now.” Give them time to think about their experience.
   b. Show the students the picture of the “calm” lakeshore: “This is what the lakeshore looks like on a calm day when there is no wind or rain.” Pass the picture so students can see it more closely.
   c. Show the students the picture of the “rough” lakeshore: “Today, strong winds and rain [or describe exact weather conditions and refer to the data collection in the journal] were causing the waves from Lake Michigan to crash into the sandy beach on the lakeshore. This causes erosion.”
   d. Demonstrate bluff erosion in front of the class: “Now I am going to show you how erosion happens with a science experiment.”
   e. Make a pile of sand to represent the bluff in a disposable turkey pan and show the students water in a bucket/cup. Explain this representation to students.
   f. “Let’s make a prediction. What do you think is going to happen when I splash waves onto this bluff?” Solicit answers from students.
   g. Demonstrate how to splash water from the bucket on one of the sand piles, towards the bottom of the pile. “Can you see how erosion eats the edge of the bluff away? This is how erosion occurs on the shoreline at the Preserve.”
   h. Demonstrate how wind also affects erosion on the shoreline: “What do you think will happen when the conditions here are windy? Use a journal to fan the bluff and represent the wind.” Demonstrate fanning to the students. “Can you see what happens to the sand when there is a lot of wind? Again, we see erosion occurring.”
6. **Educator and chaperones will help settle the students into the lounge area for activities:** “Now let’s quietly move to the lounge area and bring your journals.” Chaperones should distribute colored pencils to their groups for the journaling activities.
   a. Instruct students to do a final journal reflection on pages 12 and 13 of the journal.
   b. Introduce journal prompt #1: “Write or draw what you experienced at the lakeshore in your journal. How would you describe what you saw or heard? How would you compare the picture of the calm lakeshore to the windy and rainy lakeshore you saw today?”
   c. Introduce journal prompt #2: “Another option is to write a lakeshore story with characters from the Preserve. Add some colorful sketches to illustrate your story.”
   d. Give a two minute warning to wrap up the journal activities.
   e. If time permits, ask the students to share stories or observations from their journals with the group.

7. **Educator will wrap up program for the day with the take home messages:** “I hope you all enjoyed role-playing today as a naturalist and learned new observation skills that will help you be a better scientist! Thank you for exploring with me today – you were all awesome naturalists, even though the weather was rainy!”
   a. Ask students if they can explain the erosion at the ravine, bluff, and lakeshore.
   b. Remind students that they will be returning to the Preserve in the spring season: “I will see you next spring for your return visit to the Preserve. During that visit we will explore all of the living things that are found in the Preserve, like the plants and animal habitats.”
   c. Encourage students to return with family and friends for a nature walk.

8. **Educator and chaperones should collect any materials (except journals) from students before they leave. Chaperones can place the materials in the Educator’s backpacks.**

9. Educator should ask students questions for the daily log before they leave. Educator should provide a final goodbye and thank you to the class, and help load the students on the bus for departure.

**Acknowledgements**
This script was written by Julyne Segar, contracted Curriculum Specialist for Openlands.
Spring Pre-Visit Lesson: Prepare and Ponder with Pen Pals

Overview
- Grade Level: 3-4
- Time Needed: 30-45 minutes

This interdisciplinary activity should be done in the classroom at least one week prior to the spring visit to the Openlands Lakeshore Preserve. Students will create a fictitious pen-pal by choosing a place on a world map or globe, and will then write a letter to that person about their autumn visit to the Preserve – including their memories of that visit and their predictions for what they will experience during the spring visit. The Eco-Explorations Vocabulary List Extension Activity supplements lessons to help students prepare for their visit.

Curriculum standards met by this lesson are listed below. Please see the Curriculum Standards Chart in the Appendix of the Elementary Program Guide for more information.
- Next Generation Science Standards Performance Expectations: 4-ESS2-1

Objectives
After completing this lesson, students will be able to:
- Describe a memorable experience from their autumn visit to the Preserve
- Write a letter in a proper format
- Read a letter
- Increase their awareness of cultures from around the world
- Locate at least one country on a globe or world map

Materials Needed
- Writing paper or notebook
- Envelope
- Pencil
- Globe or world map
- Box to make a “mailbox”

Background
Science inquiry invites all kinds of excitement for a student: pondering, questioning, investigating, analyzing, recording, predicting, discovering, and exploring. When students share their science inquiry experiences in nature experiences with friends, it restates its value. A pen-pal from a different country can give the student an opportunity to learn about different societies and cultures as well as learning geography and using maps.

Preparation
Locate books, maps, or globes from the library or from the suggested on-line resources included in this lesson plan to help support the activity.
Procedures
1. Instruct students to write a letter to a fictitious pen-pal from another country. Students may choose the country and city, name of person, the age, and any other details about the friend. Provide a world map or globe for the class to help them choose the country of their pen-pal.

2. Students should explain their autumn visit to the Preserve by writing a letter to the pen-pal. Based on your grade level, tell your class how many paragraphs or pages they should be writing.

3. The pen-pal letter should include two components: what they remembered about the autumn visit to the Preserve, and what their anticipated spring visit might be like. Ask students to think about the following questions to guide them in their letter writing:
   a. Do you recall or remember any animals from the autumn visit?
   b. Do you remember seeing big roots, tree stumps or erosion?
   c. What native animals, plants or trees do you think you will see in the spring?
   d. How do you think the Preserve may look different from the fall OR from the pen-pal’s native ecosystems?

4. Remind students to sign their letter and put it in an addressed envelope. Students could place the letter in a “classroom mailbox.”

Extensions
- Research other natural areas in Illinois. If one can be visited – even by way of looking at the nature on your school campus – bring a journal with you to record your observations.
- Join a safe pen-pal group as a class. Explore options on the internet.
- Show students photos from the Autumn visit to the Openlands Lakeshore Preserve to help them remember what they saw.

Assessment
- Ask students to share a favorite paragraph of their letter by reading it to the class.

Resources
- PenPal World: www.penpalworld.com
- The Youth Online Club: www.youthonline.ca

Acknowledgements
This script was written by Julyne Segar, contracted Curriculum Specialist for Openlands.
Spring Post-Visit Lesson: Journal Reflections

Overview
• Grade Level: 3-4
• Time Needed: 30-45 minutes

This interdisciplinary activity should be done in the classroom within one week after the spring visit to the Openlands Lakeshore Preserve, in order to provide a quality reflection on the experience. Students will write about their experiences at the Preserve in their journals utilizing science, writing, drawing, and performing skills, and they will review scientific inquiry and observation skills as well. The students’ journal entries can be used as an assessment tool to identify what students learned at the Preserve during their visits. The Eco-Explorations Vocabulary List Extension Activity supplements this lesson to help students complete the activity.

Curriculum standards met by this lesson are listed below. Please see the Curriculum Standards Chart in the Appendix of the Elementary Program Guide for more information.
• Next Generation Science Standards Performance Expectations: 3-LS1-1, 3ESS2-1, 4-LS1-1, 4-ESS3-2
• English Language Arts Common Core Standards: SL.3.4, L.3.4, L.3.4d, W.3.3, W.3.8, SL.4.4, L.4.4, L.4.4d, W.4.3, W.4.8

Objectives
After completing this lesson, students will be able to:
• Describe a memorable experience from the Preserve visit
• Practice using components of the scientific method
• Write and share a story

Materials Needed
After completing this lesson, students will be able to:
• Pencils, markers, crayons, and/or colored pencils
• Eco-Explorations student journals – use pages 30-31
• Any props needed to support the journal presentations

Background
Artists are known for creating masterpieces that reflect the society we live in and our daily lives. There is a relationship between art and science and these practices share similar processes and skills, such as the use of observation skills to achieve outcomes. For example, both artists and scientists can share a passion for detail in observing the color of plants in an outdoor landscape (e.g. a botanist might record in their data for a study that the hue of the goldenrod plant is orange with a touch of gold). As another example, both artists and naturalists spend many hours studying objects for their respective work and both pay close attention to detail that is reflected in their outcomes, whether it is a work of art or a tested theory.

The scientific method is a method of inquiry that scientists use to investigate things they want to understand. The method includes making observations, formulating hypotheses, gathering data, recording data, and making conclusions.
Preparation

- Gather the student journals. These should have been collected and stored by the teacher after each autumn and spring visit to the Preserve, so that students do not lose the journals.
- Provide copies of the pre-visit vocabulary list to the students for the writing exercise.

Procedures

1. Distribute the student journals to the class. Use them to reflect upon what was seen, heard and recorded at the Preserve. What information did the students retain from the visit that is illustrated in their journals?

2. Ask students to share their journal entries from the visit. What kinds of animals live in a ravine ecosystem? Did they see an animal high up in a tree or low on the ground? What kind of smells do they remember? Did they have a favorite plant? Encourage students to ask questions of each other and you.

3. Invite students to discuss human impact on the land, talk about restoration, and explore how to save precious land in the future. How, if at all, are they inspired to help preserve their local ecosystems?

4. Now have all students write a story in their journals on pages 30-33, about their experience at the Preserve and using what they have documented already in their journal or based on the classroom discussion. Distribute copies of the Vocabulary List Extension Activity to be used as they write their stories.

5. Remind students of their experience as a naturalist and an artist at the Preserve, and the great work that they did in their journals. They may want to reproduce or add more to the drawings to supplement their stories. Encourage students to be creative! Embellishing the story is acceptable.

6. At the end of class, encourage the students to share their stories by reading them out loud during a solo performance, or as a small group skit. Students might create props and use sound effects for this.

Extensions

- Make copies of the journal entries and display at a school event. Include photos of your naturalists too.
- Encourage students to write letters to conservation organizations.
- Consider involving the class in a local habitat restoration project – other school groups might want to help!

Assessments

- Ask students to define vocabulary words used in the pre-visit lesson or during the visit to the Preserve. Choose a number of words as appropriate to your grade level.
- Conduct a survey to find out what was the most remembered fact or concept of the visit to the Preserve: plant life, animal life or habitats, lakeshore, or something else?

Acknowledgements

This script was written by Juylyne Segar, contracted Curriculum Specialist for Openlands.
Summary
Students return to the Openlands Lakeshore Preserve and observe the similarities and changes from their visit in the fall. By observing their surroundings and using a nature journal to record their experiences, students investigate the biota, for living components of the Preserve’s ecosystems.

Total Time for visit: 3 hours

Objectives
By observing their surroundings and using a nature journal to record their experiences, students will:
• Investigate the living aspects of the Openlands Lakeshore Preserve and how those factors affect the site’s ecosystems;
• Practice using the scientific method and critical thinking through observation;
• Identify and study native plants growing in the Preserve; and
• Gain knowledge of the three key concepts.

Key Concepts
• Habitats offer food, water, shelter, and space to plants and animals;
• Plants and animals can adapt to their surroundings;
• The Preserve provides habitat for native birds, mammals, and many types of insects and invertebrates; Native plants that bloom in the spring are known as “ephemerals” (having a short life cycle), and are adapted to the ecosystem in which they grow; and
• Plant and animal stories teach us about native peoples and how their lives were connected to the land.

Standards
Curriculum standards met by the on-site visit are listed below. Please see the Curriculum Standards Chart in the Appendix of the Elementary Program Guide for more information.
• Next Generation Science Standards Performance Expectations: 3-LS1-1, 3-ESS2-1, 4-LS1-1. 4-ESS3-2
• English Language Arts Common Core Standards: SL.3.4, L.3.4, W.3.8, SL.4.4, L.4.4, W.4.8
• Math Common Core Standards (Measurement and Data Standards 3.MD.B.4

Logistics
Educator should pick up the backpacks of supplies, prior to the bus arrival, at the Openlands Satellite Office (445 Sheridan Road, Second Floor Center, Highwood, IL 60040). Educator is responsible for restocking the bags after each visit from the green plastic bin marked “Eco-Explorations.” Chaperone directions are highlighted in yellow throughout this script.

Bus Arrival: Arrive at the Midwest Young Artists Building after 9:30 a.m.
Program Start Time: Between 9:45-10:00 a.m.
Program End Time: 1:00 p.m.
Bus Departure: Leave the Midwest Young Artists Building between 1:00-1:30 p.m.
Students Per Visit: 35 students maximum
Spring On-Site Visit Outline

1.) Midwest Young Artists Building: Welcome and Orientation (20 minutes)

- **Bus arrives.** Educator greets the class and helps unload the bus.
- **Restroom break.** Chaperones can help gather students in the lounge after their restroom break.
- **Educator facilitates orientation and group breakout**
  - Educator introduces him/herself and welcomes the class.
  - Review the building’s history: “Do you remember visiting this building in the fall? This building was built in 1890 and was a former jail which held 72-120 prisoners when Fort Sheridan was an active Army base. It is now a music school.”
  - Introduce chaperones. Chaperones should have been pre-oriented with the “Chaperone Guide” handout included in the Appendix of the Elementary Program Guide.
  - Break up students into six small groups, each with their own chaperone leader. Chaperones must stay with their group throughout the entire program.
- **Distribute materials and lunches**
  - Educator and chaperones will distribute nametags, journals, pencils, and binoculars to students. Consider using color coding or small stickers on nametags to help define small groups. Each student should write their name on the back of their journal.
  - Students should carry their own lunches in their backpacks. Alternatively, the teacher or chaperones can carry the lunches for the students.
  - Note that all garbage must be collected by the teacher and packed out for disposal in the parking lot receptacles or back at the school.
- **Travel to the Preserve.** Educator will assist in loading bus and will ride on bus to direct driver to the Preserve’s Patten Road parking lot. Educator will bring the supply backpack(s) on the bus.

2.) Preserve Parking Lot: Drop off and reorientation (10 minutes)

- **Bus drop off.** Before getting off the bus, the teacher should announce to students that we will get started by gathering on the concrete area at the top of the ravine stairs. Students should keep to the sidewalk and with the group, and make sure to stay out of the street while exiting the bus.
- **Bus parking.** Bus may park at MYA parking lot or on the west side of Patten Rd, south of the Preserve Parking lot.
- **Review information about the Preserve.**
  - Educator will remind students about Openlands and the Preserve: “Do you remember Openlands from our visit in the fall? Openlands is a regional non-profit conservation organization that owns and maintains this park, the Openlands Lakeshore Preserve. Openlands protects natural areas and open spaces in the Chicago area, like large areas of prairie and woodlands, rivers, streams, wetlands, and parks like the ones in your neighborhood or near your school. We are celebrating 50 years of service! The Lakeshore Preserve is a park that is open to the public and you can visit it all year long with your families.”
  - Educator will provide a quick refresher, using the laminated map of the Preserve to remind students where they are: “Let’s look at my map. We are here at the Bartlett ravine. Do you remember that we were here in the fall? Do you remember what kind of scientists we were during our last visit?” Educator should solicit answers; the correct answer is “naturalist.”
  - Educator should put on the naturalist prop hat: “Today we are going to start by walking in a different direction than we did in the fall, so everyone put on your invisible naturalist hat and let’s review our day!”
• **Rules.** “While you are here today, I am going to ask you to follow a few rules to ensure that you are safe at all times during your visit.”
  o Please walk at all times.
  o Please stay with your group and on the paths at all times.
  o Please leave the plants and rocks how and where you find them.
  o Please write down questions in your journal for discussion later.
  o Please walk behind the Educator.

• **Clicker.** Educator will demonstrate the clicker and inform the students to pay attention: “Please listen carefully for the attention-getting device. When you hear the noise, it’s time to listen for instructions.

• **Review use of tools.** Ask students to explain how to use binoculars and compasses.

• **Using the journals.** Explain that the class will visit three distinct areas: the ravine, the lakeshore, and the bluffs, in an order opposite of their autumn visit. In each area students will record observations and collect weather data.
  o Pages 16-17: As students walk with their group along the bluff, they should write observations about the ravine and answer the questions on these pages

### 3.) Upland Trail: Observations and Habitat Hunt (25 minutes)

• **Explain Habitat hunt Activity.**
  o The goal of this activity is to encourage students to use observation skills and pay attention to their surroundings or environment.
  o Explain the Habitat Hunt activity: “I am going to share a bag of items with each group.” Educator should show students items from the Habitat Hunt bag, such as a bird nest, bird house, tree cavity, burrow, spider web, etc. “All groups will look for the same items. I want you to use all of your senses and talk about your objects with your group to see where you might find it around the trail.”
  o Show students where to answer questions in their journals: “Once you have located your items, work with your chaperone to answer the questions in your journal on pages 16-17.
  o Remind groups that wildlife observation requires one to be quiet: “Remember that in order to see or hear any animals today we want to be quiet as we walk through the Preserve. We don’t want to scare them away. Please remember to keep any stories you want to share later in your mind. And remember to stay behind me and walk together in your groups.”

• **Walk along the bluffs towards the lake in small groups.** Educator should select a location for each group along the way where they can stop and focus on recording in their journal on pages 16-17. Locations should be spread out enough that small groups are not disrupting each other.

### 4.) Elemental Matters: Sharing Observations, tree observations, and collecting weather data (15 minutes)

• **Educator gathers students.** Once all groups reach *Elemental Matters*, Educator will gather students together and asks each group to share an observation with this class. *Chaperones should guide each of their students in sharing something quickly from their journals with the other students in their group; please try to make sure each student shares something.*

• **Tree observations.**
  o Educator should point out the aspen trees. Explain that trees like the aspen that are growing near the lake and the ravines prefer cooler temperatures. Usually these trees aren’t found in the Illinois area, but this area has a cooler climate because of the cool air near the lake.
  o Students should use pages 18-19 in their journal to sketch a tree that they see growing on the bluff
There are many native trees growing near here, so you may see leaves from a cottonwood, sugar maple, red oak, white oak, black oak, basswood, or aspen.”

Optional: If weather is dry, students may do a tree bark rubbing on the nearby trembling aspen trees to the north and south of Elemental Matters.

Chaperones can work with and supervise their students as they make bark rubbings or leaf sketches. Educator will walk from group to group to answer questions during the activity.

Educator will give students a two minute warning to wrap up this journaling activity.

- Last page of journal: Record weather observations
  - Demonstrate how to collect weather data using a digital weather meter.
  - Students to gather around and watch the meter. Chaperones can help students in their groups find the correct boxes on the table to write in their data.
  - When the data is collected, Educator should wrap up the activity: “We will collect the same information at two other locations during our exploration today, so we can compare the information we collect. Great job recording your data!”

5.) Lake Prism OR Elemental Matters (25 minutes)

- Lunch. If weather is dry, Educator will guide group down bluff stairs to grassy area around Lake Prism, where students can sit on the ground to eat. If weather is damp, students can remain at Elemental Matters to eat.
  - Educator should give class a two minute warning to wrap up lunch.
  - Teachers and/or chaperones must collect all lunch garbage in a bag and carry it out to the bus for disposal. Trash and recycling cans are located in the parking lot near the bus pick-up point.

- If students finish lunch early, chaperones can lead their groups through prompts listed on pages 20-21 in the journal, OR in the activities below.
  - Use colored pencils to sketch anything you see at the moment, on page 25 of your journal.
  - Share stories that are in your journal with your group and chaperone.
  - Gather by the common juniper plants (at base of bluff just south of the bluff staircase) to hear Educator talk about endangered and threatened species: “Let’s take a walk and stop at the common juniper. This plant is an evergreen shrub that produces an edible berry. The berries are used for spices in many countries to flavor meats. Native Americans used it as medicine for arthritis and stomach problems. In Illinois, it is one of our state threatened species and in some other states it is an endangered species. Do you know what an endangered species is? It is a plant or animal that is at risk for NOT being able to reproduce and is threatened to become extinct. We have other endangered and threatened plant species on the beach, too.”

- Weather data collection at the lake.
  - Direct students to the last page in the journal to record weather data.
  - Students to gather around and watch the meter. Chaperones can help students in their groups find the correct boxes on the table to write in their data.

6.) Lake Prism: Wildlife habitat game (20 minutes)

- Educator facilitates Oh Deer, adapted from the Project learning Tree program. The goal of this activity is to understand the importance of suitable habitat as well as factors that may affect wildlife populations in constantly changing ecosystems.

- Educator will introduce the game. “We are now going to play a game that will teach us about habitats. What do animals need to survive in their habitat (or home)?” Educator should solicit answers from
students. “That’s right; animals need water, shelter, food, and space in their habitat to survive, just like humans. The females (mothers) have to be able to take care of their babies or they won’t live very long.”

- **Educator will facilitate playing the game as follows:**
  - Divide class into four groups (1-4).
  - Establish two parallel lines about 25 feet apart from each other. Delineate the lines using the yellow ropes and have a chaperone stand at each end of each rope.
  - Deer (group 1) will stay on one side of playing field along one rope, with their backs turned to the other students. The goal for deer is to look for components in their habitat – food, water, or shelter – to help them survive. Show students how to gesture that they are deer by placing their fingers near the temples, like antlers.
  - The “components” (groups 2-4) will stay on the other side of playing field along the other rope, but they can stay facing the deer. Each of these three groups can choose to be a different component – food, water, or shelter – for each round. They cannot switch components in the middle of the round. Show students how to gesture that they are “food” (hand over stomach), “water” (hand over mouth), or “shelter” (hands over head to portray a roof).
  - When Educator says “go!” each deer needs to find a component of their habitat at the other end of the playing field. The deer then needs to take that component (person) back to the start line. Demonstrate this with a student before starting the game. Remind everyone to WALK.
  - After a few rounds, assign a person to be the Coyote. Coyote can start from the middle of the playing field but must hop instead of walk. During each round, Coyote gets to take one deer back to his/her “den.” Discuss the impact of predators and prey in a habitat when introducing Coyote into the game.
  - Keep track of how many deer there are at the beginning and throughout the game. Show these numbers to the students during the wrap up discussion.

- Educator will wrap up activity with a discussion of what students observed during the game: “Okay, we are done with this game and I hope you had fun! Let’s review what has happened. Was there enough food for all the deer? Was the food and water affected by weather like a drought? Did the population of the deer expand, contract, or deplete? Nature is never totally in “balance”, because it is constantly changing, but all of the plants and animals in nature have an important role in keeping enough balance so that ecosystems do not fall apart.”

- **Note:** The first few rounds may show an expanded deer population and the end of the game may deplete the deer because they starve or cannot find shelter.

- Discuss results with students.

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7. **Between Earthbark Prism and Arc of Nature: Journaling and Interview of a Ravine Plant (35 minutes)**

- **Journaling on page 22-27.** Explain to students that they will use their journal to take one more set of observations. They will record general observations in the ravine, and they will also interview a plant!

- **Explain Ravine Observations, which will be done in small groups.**
  - Educator will introduce journaling activity: “Take a few minutes to do your journal observation here, using pages 22 and 23 in your journals. What do you think you may see?” Educator should solicit answers from students to see what their predictions may be, then suggest that they might see insects, birds, squirrels, chipmunks, white-tailed deer, etc. if they need assistance with answers.
  - Educator will explain how to make observations in this area: “Now, we are going to look for evidence (like a scientist/naturalist would do) of animal homes by using our binoculars or eyes (woodpecker home, bird nest or wasp nests, etc.). Look around the Preserve and tell me what you see. Remember to look up high in the trees and low on the ground. You are looking for
evidence such as tracks, food source left behind like berries or nuts, scat, pellet, etc. that an
animal is or was present. Don’t forget to observe the big roots and holes in trees for animal and
spider or ant habitats. Did you know that Openlands has discovered 19 different kinds of ants
that live here in the ravine?" 

- **Explain Interview with a Ravine Plant, page 24-27 in journal** (adapted from the Chicago Botanic
Garden’s Environmental Education Awareness Program (EEAP) curriculum “Interview a Prairie Plant”) 
  - Educator will introduce the activity: “We are going to learn more about some of the native
  plants that live here in Bartlett Ravine. Plants tell a story. What story does your plant tell you?
  Let’s see what native plants are in bloom today. Many of the plants you see this time of year are
called “ephemerals.” This means that they have a short life cycle, and are often found low to the
  ground.”
  - Educator will instruct students in how to do the activity: “You will be making observations of
  plants and writing about the plants in your journals on pages 24-27. Please use your binoculars
to look at them up close. Do not go up the slopes or pick any part of the plants.”
  - Chaperones should distribute colored pencils to the students and collect them when the activity
    is done. Chaperones will use the ravine plant identification card sets for reference in this
    activity, to help their groups find the different plants to observe as they walk. Students may sit
down on the pavement to write and sketch. Chaperones should make sure their groups are
    seated leaving enough room for safe passage of bicycles or vehicles on the trail.
  - Educator will walk from group to group to answer questions and provide guidance.
  - **Optional:** If groups finish early, educator can distribute a variety of ravine rubbing sheets and
    crayons to groups. Students can use page 29 of the journal to make rubbings from the sheets.
    Students should supplement the rubbings with recorded data about the plants, using the ravine
    plant identification cards as a reference.
  - Educator will give a five-minute warning to wrap up the activity.
  - As groups complete their activity and reach the Arc of Nature, chaperones should collect the
    ravine plant identification cards and colored pencils from the students and place the materials
    in Educator’s backpack.
  - When all groups are gathered by The Arc of Nature, Educator will wrap up the activity by
    showing the large laminated plant pictures and discussing observations that students recorded
    in the journals.

- **Ravine safety reminder.** Educator should remind class at the mouth of the ravine that they have
  walked down the ravine in the fall and will be walking up it this time. Educator should also remind
  students of safety rules: “Please stay out of the drains for safety reasons and remember to walk.”
  Chaperones should remind their groups to stay out of the drains and keep a walking pace, as it is
  needed.

- **Walk through the ravines away from the lake.** Educator should select a location for each group along
  the way where they can stop and focus on recording in their journal on pages 22-27. Locations should
  be spread out enough that small groups are not disrupting each other.

8.) **Arc of Nature: Conclusion (10 minutes)**

- **Collect Weather data.**
  - Direct students to the last page in the journal to record weather data.
  - Students to gather around and watch the meter. Chaperones can help students in their groups
    find the correct boxes on the table to write in their data.
  - Educator can ask students what were the similarities and differences in weather data through
    their observations?
• **Wrap up messages.**
  o “I hope you all enjoyed role-playing today as a naturalist and learned more observation skills that will help you be a better scientist! We are coming to the end of our visit today and this is a good time to look closely at this mural, which was made by artists from the Chicago Public Art Group. The mural shows us a lot of things that we saw at the Preserve this year.”
  o “What do you see and why is this symbol or object on the mural? What do you think it represents? What story is this mural telling us?” Educator should solicit answers from students. “That’s right, we saw ants, spiders and birds because this is their habitat. We learned a lot of information about the ravine plants, and some of the plants tell us a story. Many times those stories give us clues as to how how Native Americans used or appreciated the plants.” The students will usually see these symbols: the wood with rings/the solar system represent circles and cycles, large tree roots, water/lake and the white trillium. “The mural reflects all of the living and non-living factors here at the Openlands Lakeshore Preserve.”
  o Educator encourages students to return with family and friends for a nature walk.
  o “Thank you all for sharing and doing a great job on collecting data in your journal! Now it is time to return to the bus.”

9.) **Parking Lot: Load Bus (5 minutes)**

• **Collect materials and load bus.**
  o Chaperones should help Educator gather binoculars, colored pencils, and any other materials (except the student journals), and place them in the Educator’s backpacks. As each group’s materials are turned in, the chaperones can begin leading their groups back to the bus and loading the students onto the bus.
  o Educator should pack up the materials in the backpacks and follow the students to the bus when ready. Educator will ride with the class back to the Midwest Young Artists building, and should complete the daily log during the ride over.
  o Educator should remind teachers to gather their journals from the students so they can be used for the post-visit lesson.

• **Depart Preserve for MYA.**

10.) **MYA: Final departure (15 minutes)**

• **Restroom break.** Educator will help load and reload the bus for a second restroom break.
• **Thank you!** Educator should thank the teacher, chaperones, and students for coming, and see the bus off for its return to the school.
• **After class departs, Educator prepares for next visit.**
  o Scan the backpack for missing items and restock as needed for the next visit. Extra items are stored in the Openlands on-site shed, in the green plastic bin marked “Eco-Explorations.”
  o Email the completed daily log to Openlands within one week of the visit.
Indoor Extension Activities for Inclement Weather

These extensions may complete the final 1 to 1.5 hours of the visit if inclement weather requires the visit to be cut short. Indoor activities are designed to replace the “Lakeshore Meets Bluff” activity and include a discussion of the effects of erosion on the lakeshore, with writing and sketching exercises in the journals.

**Location:** Midwest Young Artists Building

**Duration:** Replaces 1 to 1.5 hours of the outdoor program depending on weather conditions

1. Before leaving the site, Educator should collect 5-6 ravine native plant samples of species that are represented in the ravine plant identification cards.
2. Educator will guide class back to the bus and return to MYA.
3. Educator will help unload the bus and guide students indoors. Students may take a restroom break prior to transitioning into the indoor extension activities. Students should sit in their small groups with their chaperones once inside the building’s café area.
4. **Optional:** If students still need to eat lunch, they may take 20-30 minutes to eat in the café area before starting activities. If inclement weather seems to be on its way before the bus arrives in the morning, Educator should check with the Midwest Young Artists staff to ensure the café area is available.
5. **Educator will provide one ravine plant sample, hand lenses, and colored pencils for each small group.** Students should study the plant sample with their hand lenses, sketch it in their journals, and answer the journal prompts on pages 24-27.
6. **Optional:** If they finish the observations early, students can do ravine plant rubbings on page 30-31 using crayons and the rubbing sheets provided by Educator. Students record data in their journals about the plants they make rubbings of, using the ravine plant identification cards as reference.
7. Educator will ask questions of each group: e.g. what is the name of the plant they are studying and list a few facts about it. Educator should give a two minute warning to wrap up the activity. If time permits, Educator can ask the students to share stories or observations from their journals with the group.
8. **Educator will wrap up program for the day with the take home messages:** “I hope you all enjoyed being naturalists and learned new observation skills that will help you be a better scientist! Thank you for exploring with me today – you were awesome naturalists, even though the weather was rainy!”
   a. Ask students to share their favorite animal home they found at the Preserve today.
   b. Encourage students to return with family and friends for a nature walk.
9. **Educator and chaperones should collect any materials (except journals) from students before they leave. Chaperones can place the materials in the Educator’s backpacks.** Educator should remind the teacher to collect the journals for the post-visit activity.
10. Educator should ask students questions for the daily log before they leave. Educator will provide a final goodbye and thank you to the class, and help load the students on the bus for departure.

**Acknowledgements**

This script was written by Julyne Segar, contracted Curriculum Specialist for Openlands.
Appendix

Exploring the scientific method at the lakeshore
### Appendix 1: Program Standards

#### Next Generation Science Standards Alignments

<table>
<thead>
<tr>
<th>Code or category</th>
<th>Grade</th>
<th>Descriptions</th>
<th>Eco Explorations Program Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectation HS-ESS2-2</td>
<td>9-12</td>
<td>Analyze geoscience data to make the claim that one change to Earth’s surface can create feedbacks that cause changes to other Earth systems.</td>
<td>X X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS2-5</td>
<td>9-12</td>
<td>Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.</td>
<td>X X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS2-7</td>
<td>9-12</td>
<td>Construct an argument based on evidence about the simultaneous coevolution of Earth systems and life on Earth.</td>
<td>X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-4</td>
<td>9-12</td>
<td>Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.</td>
<td>X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-1</td>
<td>9-12</td>
<td>Use mathematical and or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.</td>
<td>X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-6</td>
<td>9-12</td>
<td>Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable condition, but changing conditions may result in a new ecosystem.</td>
<td>X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-2</td>
<td>9-12</td>
<td>Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.</td>
<td>X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-8</td>
<td>9-12</td>
<td>Evaluate the evidence for the role of group behavior on individual and species’ chances to survive and reproduce.</td>
<td>X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-5</td>
<td>9-12</td>
<td>Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.</td>
<td>X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-6</td>
<td>9-12</td>
<td>Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.</td>
<td>X X X</td>
</tr>
<tr>
<td>Performance Expectation HS-ESS3-5</td>
<td>9-12</td>
<td>Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.</td>
<td>X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Asking questions</td>
<td>X X X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Developing and using models</td>
<td>X X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Planning and carrying out investigations</td>
<td>X X X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Analyzing and interpreting data</td>
<td>X X X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Using mathematics and computational thinking</td>
<td>X X X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Constructing explanations and designing solutions</td>
<td>X X X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Engaging in arguments from evidence</td>
<td>X X</td>
</tr>
<tr>
<td>Practice</td>
<td>K-12</td>
<td>Obtaining, evaluating, and communicating information</td>
<td>X X X</td>
</tr>
<tr>
<td>Crosscutting Concept</td>
<td>K-12</td>
<td>Patterns</td>
<td>X</td>
</tr>
<tr>
<td>Crosscutting Concept</td>
<td>K-12</td>
<td>Cause and Effect</td>
<td>X X X</td>
</tr>
<tr>
<td>Crosscutting Concept</td>
<td>K-12</td>
<td>Scale, proportion, and quantity</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Crosscutting Concept</td>
<td>K-12</td>
<td>Systems and system models</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Crosscutting Concept</td>
<td>K-12</td>
<td>Energy and matter</td>
<td>X X</td>
</tr>
<tr>
<td>Crosscutting Concept</td>
<td>K-12</td>
<td>Structure and function</td>
<td>X X X</td>
</tr>
</tbody>
</table>

Openlands Lakeshore Preserve Eco-Explorations Elementary Program Guide - Grades 3-4
### Crosscutting Concept
- **K-12:** Stability and change

### Disciplinary Core Ideas
- **K-12:** Life Sciences
- **K-12:** Earth and Space Sciences
- **K-12:** Engineering, Technology, and Application of Sciences

### Common Core English and Language Arts Standards

<table>
<thead>
<tr>
<th>Code</th>
<th>Grade</th>
<th>Standard</th>
<th>Fall Pre-Visit</th>
<th>Fall Post-Visit</th>
<th>Fall Site Visit</th>
<th>Spring Pre-Visit</th>
<th>Spring Post Visit</th>
<th>Spring Site Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.11-12.1</td>
<td>11-12</td>
<td>Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W.11-12.2</td>
<td>11-12</td>
<td>Write informative and explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W.11-12.3</td>
<td>11-12</td>
<td>Write narratives to develop real or imagined experiences or events using effective technique, wellchosen details, and well-structured event sequences.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>W.11-12.10</td>
<td>11-12</td>
<td>Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.11-12.4</td>
<td>11-12</td>
<td>Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11-12 reading and content, choosing flexibly from a range of strategies.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>L.11-12.6</td>
<td>11-12</td>
<td>Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### Common Core Mathematics Standards

<table>
<thead>
<tr>
<th>Code</th>
<th>Grade</th>
<th>Standard</th>
<th>Fall Pre-Visit</th>
<th>Fall Post-Visit</th>
<th>Fall Site Visit</th>
<th>Spring Pre-Visit</th>
<th>Spring Post Visit</th>
<th>Spring Site Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS-MD.B.5</td>
<td>9-12</td>
<td>Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>HS-MD.B.5b</td>
<td>9-12</td>
<td>Evaluate and compare strategies on the basis of expected values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Appendix 2: Memorandum of Understanding

This Memorandum of Understanding (MOU), signed by the school principal and participating classroom teachers, acknowledges that each signatory is committed to the program elements listed below. The MOU must be completed and on file prior to any school participating in the Eco-Explorations program.

Records and Contact Information
The Eco-Explorations program is managed by John Cawood, Openlands Education Program Coordinator. Please direct all questions to John at 312-863-6276 or jcawood@openlands.org.

Please make copies of this signed document to keep as records for your school, and for each participating teacher if desired. Return original signed copy to John Cawood, Education Program Coordinator, Openlands, 25 E. Washington Street, Suite 1650, Chicago, IL 60602.

Openlands' Role
Openlands will provide the following to each participating classroom, an estimated value of $2,600 per class:

- Pre-visit and post-visit lessons in a comprehensive Program Guide
- Paid bus transportation to and from each on-site Eco-Exploration, with restroom stops
- Educator to guide teachers and students during each on-site Eco-Exploration
- Teacher training
- Supplies (including a take-home journal) for all on-site activities
- Substitute pay for high school teachers

Requirements for Participating Schools
Each participating teacher agrees to the following required elements of the Eco-Explorations program:

1. **New Teachers Attend a Teacher Orientation Session (one per school year)**
   - This is required of all new teachers. Teachers who do not attend an orientation will not be able to participate in the program.
   - Orientation sessions are hosted by Openlands staff and educators.
   - New teachers will attend an approximately two hour long meeting at the start of the school year. The meeting is held at the Preserve and Openlands' Highwood office.
   - Returning teachers who have previously participated in the program will attend a modified refresher orientation session at the start of the school year. The refresher orientation is designed to cover any new program changes while offering an opportunity for peer discussion about activity adaptations and extensions. The location of the refresher session will be determined by Openlands staff.

2. **Complete All Pre-Visit and Post-Visit Lessons in the Classroom (four per school year)**
   - There are four classroom lessons per school year that all teachers are required to complete. This includes a pre-visit lesson and a post-visit lesson for the autumn on-site Eco-Exploration, and the same for the spring visit.
   - Pre- and post-visit lessons are critically important because they provide students with a foundational knowledge of concepts applied in the on-site visits and help to synthesize the experience afterwards. Failure to complete the four lessons will negatively impact the quality of the experience.
   - Teachers are responsible for providing materials needed for each lesson, which are limited and generally available in most schools and households.
3. **Attend On-Site Eco-Explorations (two per school year)**
   - Teachers must attend an on-site Eco-Explorations visit with their classroom in the autumn, and then again in the spring each school year.
   - Openlands provides an educator for each on-site Eco-Exploration and Openlands staff will work with teachers to arrange each visit.

4. **Post-Visit Online Surveys (two per school year)**
   - Each teacher is required to complete two brief online surveys about their experience in the Eco-Explorations program per school year. This valuable feedback helps Openlands to continue improving the program.
   - Openlands staff will email a survey to each teacher within a few weeks of the end of the autumn portion of the program, and then again at the end of the spring portion of the program.

---

Openlands Signature

Openlands Representative (Please print)

Principal Signature

Principal Name (Please print)

Teacher Signature

Teacher Name (Please print)

Teacher Signature

Teacher Name (Please print)

Teacher Signature

Teacher Name (Please print)

Teacher Signature

Teacher Name (Please print)
Appendix 3: Map and Directions

Overview
We recommend teachers bring along these directions for each on-site visit to the Openlands Lakeshore Preserve. We provide detailed directions to the bus company prior to your visits, but it is helpful to plan for a backup. If you have any trouble with your buses, please contact John Cawood, Openlands Education Program Coordinator, at 312-863-6276 or on the cell phone number you were provided at the teacher orientation.

Directions to the Midwest Young Artists Building
Visits to the Preserve begin at the Midwest Young Artists building, a youth music school located nearby. Here students can begin with a restroom break and orientation to the day’s activities.

Street Address: 878 Lyster Road, Highwood, IL 60040
GPS Coordinates: 42°12'54.78” N, 87°48’58.04” W

To get there from Chicago:
- Take I-94 W and exit onto Half Day Road (Route 22).
- Turn right (east) onto Half Day and continue past Route 41. As you pass into the Highwood city limits east of Route 41, Half Day Road will turn into Prairie Avenue.
- Turn left at Green Bay Road when Prairie Avenue dead ends.
- Pass the stop sign at Highwood Avenue. Continue to the stop sign at Washington Street.
- Turn right onto Washington Street and then left at the stoplight onto Sheridan Road. Please note that Sheridan Road is also called Waukegan Avenue in parts of downtown Highwood.
- At the stoplight at Old Elm Road, turn right onto Simonds Way.
- Turn right at the stop sign onto Leonard Wood Avenue W.
- Leonard Wood Avenue W turns into Lyster Road if you continue straight. The Midwest Young Artists building will be on your right just before you reach Whistler Road.

To get there from northern Lake County:
- Take I-94 E and exit onto Townline Road (Route 60).
- Turn left (east) onto Townline Road and continue until it dead-ends at Route 41.
- Turn right onto Route 41 and take it to Old Elm Road.
- Turn left onto Old Elm and continue straight over the train tracks and through the stoplight at Sheridan Road to enter the Town of Fort Sheridan. Old Elm turns into Simonds Way just east of the stoplight.
- Turn right at the stop sign onto Leonard Wood Avenue W.
- Leonard Wood Avenue W turns into Lyster Road if you continue straight. The Midwest Young Artists building will be on your right just before you reach Whistler Road.

If you wish to add a bus tour of the historic Fort Sheridan parade grounds to your visit:
- Follow the directions above to enter the Town of Fort Sheridan, but then turn left at the stop sign onto Leonard Wood Avenue N. You can follow the circle all the way around to Whistler Road, and then turn right onto Whistler to head back to the Midwest Young Artists building. See the map on the following page for more information.
Appendix 4: Chaperone Duties

Welcome to the Openlands Lakeshore Preserve, and thank you for Chaperoning today! As a chaperone you will manage a small group of students and help them to stay on task during today’s field trip. Each student will receive a journal, a pencil, binoculars, and a compass. Throughout the day, students will keep track of these things and write in their journals.

As a Chaperone we ask that you help with the following today:

- Passing out and carrying materials if necessary
- Guiding your student group through writing activities
- Helping to keep students together in their groups
- Reminding students of the rules (walking at all times, staying on paths, leaving nature as it is found)
- Have fun!!!!!

We will start in Bartlett Ravine. Here are things to remember in the ravine:

- Students should write their names on their journals
- Students should complete pages 4-7 in their journals. If they run out of space, use pages 10-11.
- Students should record weather data on page 34.
- SAFETY: Remind students to stay on the road when walking through the ravine.
Next, we will go to the Lakeshore for more educational activities and to eat lunch. Here are things to remember at the Lakeshore:

- Students should complete pages 8-9 in their journals. If they run out of space, use pages 10-11.
- Students should record weather data on page 34.
- SAFETY: Remind students to stay away from the water. Chaperones may need to collect water for the beach activity on erosion.

Lastly, We will climb the stairs to walk along the bluff. Here are things to remember at the Bluff:

- Students should record observations on pages 10-11.
- Students should record weather data on page 34.

At the end, please help the educator gather all the supplies, except journals. Students can keep the journals until their teacher collects them.
Appendix 5: Photo Release Form

Dear Parent/Guardian,

Openlands partners with your school for the Openlands Lakeshore Preserve Eco-Explorations program. During this year’s program, we will be taking some photographs that include students. We would like to be able to share these photographs for publication purposes. By signing below, you approve the use of photographs with your child in them to be published.

I hereby authorize Openlands to use or distribute the name and positive photograph of my son/daughter/custodial child:

_______________________________________________________________
(Student’s Name – Please Print)

and any reproductions thereof in such a manner, for such a purpose, and in such publications as it or its assigns may from time to time determine and I hereby release and discharge said company and its assigns from any and all liability in connection with such publication and use.

As a parent or guardian of the above named person, I consent to the above release, signature thereto and to the uses therein set forth.

_______________________________________________________________
(Parent Signature)

_______________________________________________________________
(Student Signature)

_______________________________________________________________
(Date)

Openlands Lakeshore Preserve Eco-Explorations Elementary Program Guide – Grades 3-4
About Openlands

Founded in 1963, Openlands protects the natural and open spaces of northeastern Illinois and the surrounding region to ensure cleaner air and water, protect natural habitats and wildlife, and help balance and enrich our lives.

The Openlands Lakeshore Preserve

Located just 25 miles north of Chicago, the 77-acre Preserve is a designated Illinois Nature Preserve situated on more than a mile of Lake Michigan shoreline. Featuring extraordinary bluff, beach, and ravine ecosystems, the Preserve presents a rare opportunity to visit a unique natural resource, bringing to life the rich history of our region and linking it to today’s critical environmental issues.

The Preserve is a model for outdoor learning, offering many conservation-focused educational opportunities for people of all ages and backgrounds, including site-specific interpretive artworks by regional artists; podcasts and interactive maps; the Eco-Explorations school program with elementary and high school level curriculum focused on the unique ecology of the ravines and bluffs; and volunteer and public educational program opportunities. Ecological restoration and biological monitoring programs demonstrate the critical role humans play in the stewardship of natural resources.

Contact Us

Address: 25 E. Washington Street, Suite 1650
Chicago, IL 60602
Phone: 312-863-6250
Fax: 312-863-6251
Email: lakeshorepreserve@openlands.org
Web: www.openlands.org
facebook.com/openlandschicago
twitter.com/openlands

Join Us! Become an Openlander today. Visit www.openlands.org to discover how you can help us create a greener, healthier tomorrow!