

# Pfeiffer Nature Center



**Where Science, Art, and Nature Come Together!  
Educator Resource Guide**



**For information on Pfeiffer Nature Center, visit their website and Facebook.**

<http://pfeiffernaturecenter.org> / <https://www.facebook.com.PfeifferNatureCenter/>

## Educator Resource Guide

**There is no better classroom than the outdoors.**



This Guide, created by the Pfeiffer Nature Center and University of Pittsburgh Bradford Education Program, is designed for teachers and students in the middle and secondary grades (7-12) to help prepare everyone for an exciting, meaningful, and fun visit to the Lillibridge Property at the Pfeiffer Nature Center.

Teachers are strongly encouraged to adapt the activities to support specific state or national standards, along with the needs and interests of their students. We encourage teachers to have students work in small groups to make observations, collect data, compare and classify organisms, draw conclusions, and share their discoveries.

Activities developed support [Next Generation Science Standards \(NGSS\)](#), specifically, [MS-LS2-4 Ecosystems: Interactions, Energy, and Dynamics](#). Students who demonstrate understanding can support or refute an explanation or a model for a phenomenon or a solution to a problem regarding changes to physical or biological components of an ecosystem supported by empirical evidence that builds on experiences and progresses about the natural world. This Resource Guide also meets [PA Standards](#) and [New York State Standards](#).

Teachers can find additional resources at the end of the guide to help cross-curricular lesson planning when selecting activities to do before, during and after your visit.

There is a map of the area, and a “Plan Ahead and Prepare” section to keep you and all of your students safe. Historical information for the Nature Center is available.

**Did you know?** You can find interesting bits of information scattered throughout the guide.

Look for the Woodpecker!

**Emergencies:** Cell phone reception is usually reliable.  
Dial 911 for assistance.

**Mailing Address:** PO Box 802, Portville, NY 14770

**Administration Office Phone Number:** (716) 933-0187

The Resource Guide is created in part by members of the Secondary Education Program, the Division of Communication and the Arts, Division of Biological and Health Sciences at the University of Pittsburgh Bradford, and administration of the Pfeiffer Nature Center.



**PittBradford**



## Table of Contents

Introduction .....	page 2
Visitor Information and Trails .....	page 4
Trails and Hiking .....	page 5
Teaching on the Trails .....	page 6
Plan Ahead and Prepare! .....	page 7
A few ways to enjoy Pfeiffer Nature Center .....	page 8
Field Trip Activities .....	page 9
Anticipation Guide .....	page 10
Nature Journaling .....	page 11
Nature Journaling Suggested Activities.....	page 12
History of the Pfeiffer Nature Center.....	page 13
Historical Role Play Activity .....	page 14
Bluebirds at Pfeiffer Nature Center: New York’s State Bird .....	page 15
Build a Bluebird Box .....	page 16
Think like a Scientist .....	page 17
What is Biodiversity? .....	page 18
Taxonomy .....	page 19
Plant Kingdom .....	page 20
Classifications of Plants at Lillibridge .....	page 21
Classifications of Animals at Lillibridge .....	page 22
Discover Vernal Pools at Lillibridge .....	page 23
Energy Flow through the Ecosystem at Lillibridge .....	page 24
Ecosystem Interactions .....	page 25
Ecosystem Table.....	page 26
Discover the Plants at Lillibridge .....	page 27
Discover the Trees at Lillibridge .....	page 28
Adaptations .....	page 29
Plant Graphic Organizer .....	page 30
Animal Graphic Organizer .....	page 31
Niches .....	page 32
Niches Observation Worksheet .....	page 33
Name the Animal .....	page 34
R.A.F.T. Activity .....	page 35
More R.A.F.T Activities .....	page 36
Art Activities with Nature .....	page 37
Template for Art Activities with Nature.....	page 38
Write a poem or song about your experiences at the Nature Center .....	page 39
Take a Sound Walk as a Soundscape Scientist! .....	page 40
A Very Special Opportunity – Geocache .....	page 41
Cloze Activity .....	page 42
Discoveries at Pfeiffer Nature Center Crossword.....	page 43
Discoveries at Pfeiffer Nature Center Crossword Clues.....	page 44
Answer Keys .....	page 45
Species List Appendix .....	page 46
List of Standards .....	page 47-48
Citations.....	page 49-50
Teacher and Student Evaluations .....	page 51-52

## Visitor Information & Trails



Pfeiffer Nature Center is home to more than 648 acres of nature's bounty. Pfeiffer Nature Center consists of two properties. The Lillibridge property located at 1974 Lillibridge Road, Portville New York and the Eshelman Property located at 1420 Yubadam Rd, Portville New York. Our administrative office is located at 14 South Main Street, Portville NY 14770. For the purposes of this manual, only the Lillibridge property will be explored in detail. The Lillibridge Property features a rustic American Chestnut Log Cabin listed in the National & State Registers of Historic Places. The front of the cabin offers a spectacular panoramic view of the region. The Cabin is open to the public during specific events or by appointment.

In the meadow, a timber frame pavilion offers a covered shelter for picnics or other events. Electricity is available at the Pavilion. The most notable and majestic feature is the 20 acres of rare, old-growth forest. It includes large specimens of Eastern Hemlock, White Pine, Red and White Oak, American Beech, and more.

The Lillibridge Property consists of 188 acres and nearly 5 miles of hiking trails. One of our trails, Griffin's Way, on this property is handicapped-accessible.

Hikes on our nearly five miles of marked foot-trails pass through a variety of forest ecotypes, such as coniferous and deciduous forests. Our terraces and slopes that rise 700 feet above the valley hint at 350 million years of geologic history.

For those who want to learn more about the natural world, the Nature Center offers interpretative opportunities in science, nature, and art through programs and events. The Lillibridge Property is open dawn to dusk, year-round.

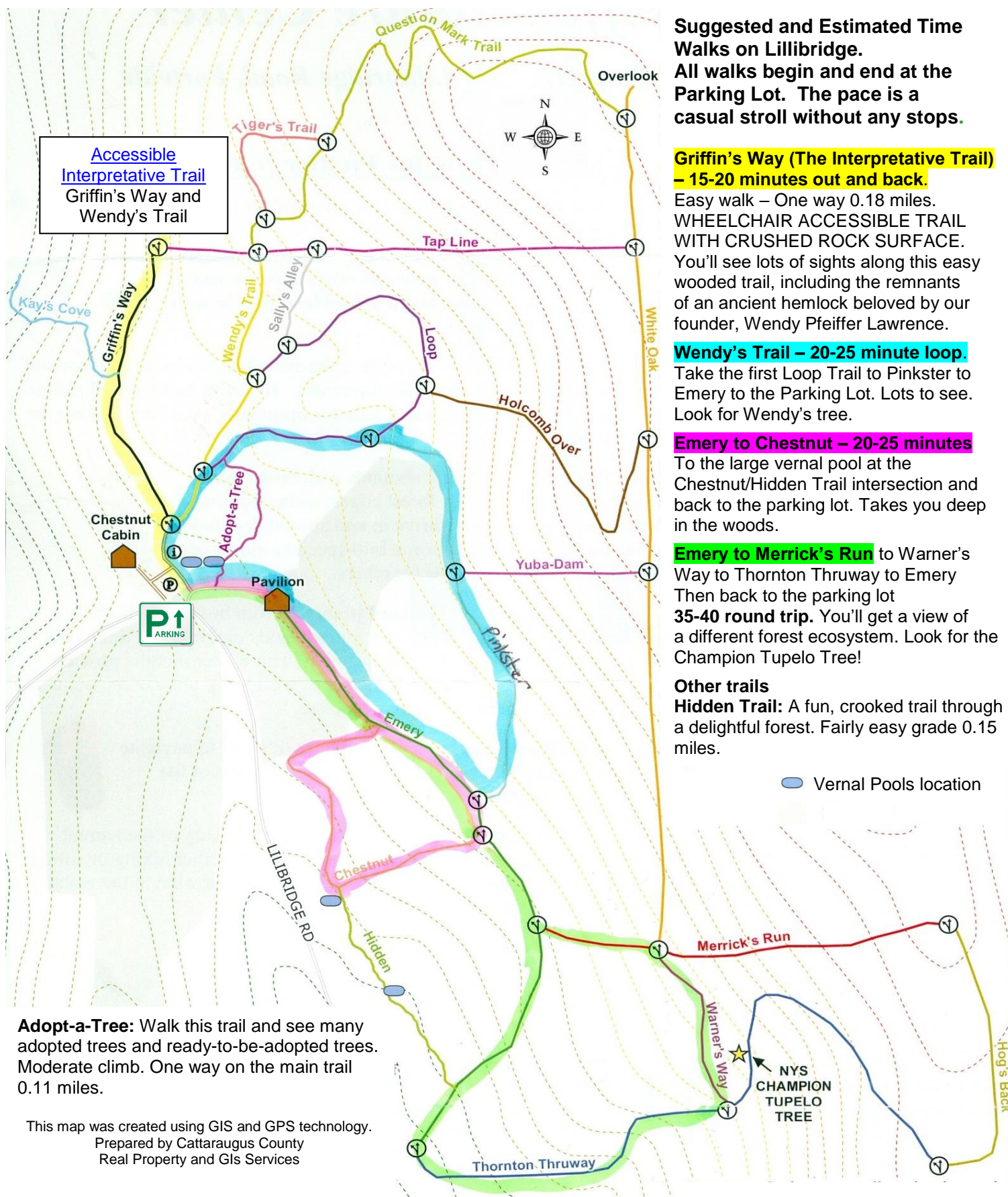
Be sure to spend some time at the Pavilion and look for the animal tracks along the edge of the Pavilion. There is an activity to do with this exploration on page 34.



**Did you know?** Wondering how the squirrel finds its way back to the buried food? They have an excellent sense of smell and can locate their food even beneath a layer of snow. <https://www.livescience.com/64104-how-do-squirrels-find-buried-nuts.html>

# Trails and Hiking

## Lillibridge Property with Historic Cabin, Pavilion and Trails



## Teaching on the Trails

**Goals:** Students will make and record observations and draw conclusions from them.

Here are suggestions to ensure safe, successful, worthwhile lessons and experiences:

Use key points along the trail to conduct specific activities. This helps the students focus on specific features of the trails and environment.

Show enthusiasm, excitement, and a positive attitude. Make sure your students hear this in your tone of voice and can see it in your body language. Create a sense of adventure or mystery.

Enjoy what your students find. Look at what they are showing and share these discoveries with the whole group. Allow students the opportunity to explore their surroundings.

To be safe, comfortable, and excited about learning in the outdoors, students need time to explore the areas. Remember, this may be a new experience. They need the opportunity and time to adjust.

Emphasize observation using all of their senses. Be sure they are not wearing ear buds and listening to music. Have them listen to the sounds of the woods.

Be flexible and remember that in the natural world, everything is connected to everything else. Let students experience nature in the moment and then link that moment back to your lesson.

Become a “guide”, “explorer” and “learner.” You do not and could not know everything about nature. Share what you discovered with the students.

Create an atmosphere of investigation and share your excitement about learning new things. If you are excited about learning, then your students will be excited as well!

Ask guiding questions. Avoid giving direct answers to students’ questions. Help them discover *answers* on their own.

### Nature Field Trip Day Checklist

Check	Item
	Create student and chaperone emergency contact cards.
	Pack a First-aid kit.
	Make sure water bottles are packed.
	If you plan to eat, pack lunches or healthy snacks as well.
	Emphasize the importance of staying with your group and group leader at all times.
	Cover emergency procedures and distribute contact information.
	Discuss any health considerations for individual students.
	Review class rules, expectations, and consequences.
	Go over details of learning activities, highlighting important concepts or prompts.
	Specify how everyone should be arranged on the trail.
	Remind students to leave valuables behind. The forest isn’t a good place for electronics.
	If appropriate, provide nametags for students and adults.
	Identify the beginning location and where people will meet at points during the field trip.
	Ask Pfeiffer Nature Center about Restroom facilities.

## Plan Ahead and Prepare!

### Admission:



Memberships, donations, and “Adopt-A-Tree” sponsorships help us maintain the trails and provide educational programs to the public. Please consider becoming a member if you love our trails!

Become familiar with the trail map and plan your walks. Lillibridge has a wheelchair accessible interpretative trail that is noted on the map.

Check to see your cell phone works from the site in the event of an emergency. Insect repellent can be helpful in the woods. Ticks are common in our area so be sure to perform a [“Tick Check”](#) before leaving the property.

### Watch for changing weather conditions.

☛ The forest sheds dead wood from overhead tree limbs during windy conditions. We advise that you exit the woods during windy conditions or at the first signs of thunderstorm activity.

### Remain on the trails.

☛ Stay on the trails. This is to protect the plants and habitat of the property and makes sure you won't get lost.

### Leave what you find.

- ☛ Preserve the past: examine, but do not touch, cultural or historic structures and artifacts.
- ☛ Leave rocks, plants and other natural objects as you found them.
- ☛ Lillibridge is home to both protected and endangered species.

### Respect wildlife.

- ☛ Observe wildlife from a distance. Do not follow or approach them.
- ☛ Never feed animals. Feeding wildlife damages their health, alters natural behaviors, and exposes them to predators and other dangers.
- ☛ Control pets at all times or leave them at home. Pick up after your pets.

### Be considerate of other visitors.

- ☛ Respect other visitors and protect the quality of their experience.
- ☛ Be courteous. Yield to other users on the trail.
- ☛ Let nature's sounds prevail. Avoid loud voices and noises.
- ☛ This is a “Carry-in, carry-out” location. Be sure to take what you brought in with you when you leave.

### Seasonal Concerns and property hazards:

The Lillibridge Road approach from Olean (Wolf Run) is steep and snow drifts in. It is recommended that you approach the Lillibridge Property from Portville during the winter and any adverse conditions.

## A few ways to enjoy Pfeiffer Nature Center

**Hike our trails** – We maintain nearly five miles of marked trails. There's something for everyone, whether you like a short, easy stroll through a [successional meadow](#) or a moderately difficult climb through the woods. Our accessible trail makes a section of the [old-growth](#) and [second-growth](#) forest available to people with mobility or sensory impairments.



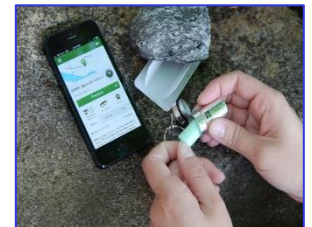
**View the wildlife** – If you're quiet and alert, you're sure to see and hear lots of squirrels and chipmunks. If you're lucky, you'll also see deer, turkey, salamanders, skunks, opossums, raccoons, and maybe even a bear.

**Watch the birds** – Our property abounds with birds. Some seek deep woods, others prefer forest edges; some require [coniferous areas](#), while others thrive in and around [deciduous trees](#). The meadow is home to some bird species, and its edge provides a transition area crucial for others.



**Enjoy the wildflowers and plants** – From broad stands of [goldenrod](#) to the single, rare, [deep-woods orchid](#), something is in bloom from April through October. The winter months provide their own beauty, with [spore stems](#), seed pods, open branches and evergreens for visitors to appreciate.

**Stimulate your adventurous side** – Use your GPS unit to navigate to our geocache sites. They'll take you to different parts of the property, and you might learn and discover something on the way.



**Renew your energy** – The solitude and beauty of the natural world is a tonic that can't be matched. Whether hiking or sitting quietly, leave your daily stress behind and breathe in the wonder of your surroundings.

**Share your observations and comments** – Sign the visitor registry and log your observations. It is fun to read what other have seen, too. Reach our staff by mailing a note, calling, or sending an email.



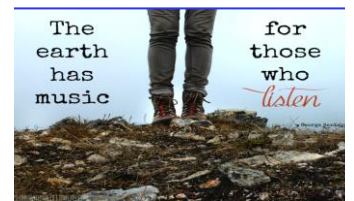
**Share the benefits** – Tell others about our Center and encourage them to visit. Become a member of Pfeiffer Nature Center. Membership information can be found at the kiosk or on our website. Your support helps us to achieve our mission and ensure that our preserve will be here for generations to come.



## Field Trip Activities

Experiencing nature can be excellent for quiet contemplation, active play, intense observation, questioning, independent work, group projects, and relaxation.

- Before taking students outside, decide the type of experiences you want them to have.
- Keep plans simple. You and your students need time to adjust to this new environment.
- Identify how to get students' attention outdoors. Create a clear signal for everyone to listen and gather at a specific location. Practice it!
- Share photos, videos, or brochures. Describe the habitat, such as wildlife, and plants they may see.
- Introduce the subjects that will be covered at the field trip, like bird adaptations and ecology.
- Discuss observation techniques and practice making observations.
- Model how students will use the journal and do a class entry.
- Identify an introductory activity to excite your students about the outdoors. When you arrive at Pfeiffer Nature Center, have students close their eyes and draw or write down what they hear.
- Have a pocketful of leading questions to stimulate exploration and help students focus on specific objectives.
- Take a few quiet breaks along the trails. In small groups, have students take one of the following roles: observer, writer, artist, using their journal. Have students sit or stand without talking to see how many different things they see and hear. Ask: Why is hearing important for animals? Which animals have an acute sense of hearing, seeing smell, taste or touch?
- Point out relationships in nature. Use questions such as: In what way do plants and insects help each other? How do insects help people?



### Resources for you to visit

[Nearby Nature School Field Trips: An Educator's Guide to Teaching in Local Natural Areas](#)

[Are you a Natural Teacher?  
Put more Vitamin "N" into your classroom](#)

[Teaching outside the Classroom](#)



## Anticipation Guide

***One of the best ways to appreciate nature is to observe and experience it.***

Before your visit to Pfeiffer Nature Center, spend a few minutes to decide what the class may find and would like to discover. You can start by creating a K-W-L chart. Some suggestions are listed. After the visit, they complete the guide by providing evidence for their decision to agree or disagree with the statements. First, have students read each statement. Check the "I agree" or "I disagree" box as they begin their journey.

**Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Before Visiting			After Visiting		
Statement	I agree	I disagree	I agree	I disagree	Evidence
There are three types of maple trees found in temperate forests.					
Vernal pools have lots of residents during the winter.					
Fungus is found only on the ground.					

# Nature Journaling

## What is nature journaling?

Nature journaling is your path to exploring the natural world and to recording your personal connections with nature. Observation of nature is the best way to appreciate how the beautiful earth with all its intricacies. Besides trees, the smallest insect is amazing to watch. It's a very effective way to teach science, art, writing, and research skills. [John Muir](#), the famous naturalist, explorer, writer, and conservationist who helped the US Congress create [Yosemite National Park](#), [Petrified Forest](#), and [Grand Canyon](#) National Parks. He observed nature with an old overcoat, a crust of bread, empty journals, sketchbooks, writing and watercolor pencils and pencil sharpeners. A great resource is *How to Keep a Naturalist's Notebook Paperback* by [Susan Leigh Tomlinson](#)

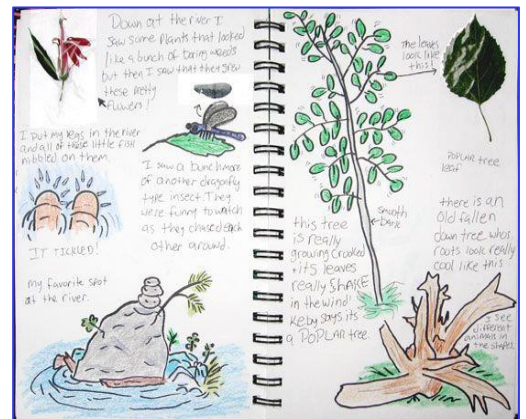
Nature journaling should not be rushed. Leave sufficient time for relaxed observation and enjoyment. A great place to reflect on what the students have seen and where they can share their journals is at the Pavilion. Students can also keep a "Group Journal" where each "botanist" contributes observations. Also be sure you keep a journal and share it with the students!

A nature journal can include sketches of animals and insects, pressed flowers, poetry, or photographs. Use as many senses as possible to get a close-up view, touch (if possible) and smell (if possible) what you're observing. Start sketching, writing immediately or take some pictures. When walking, draw or note the first thing that catches their attention.

**What can be included in a nature journal?** [Check out this website for ideas of creating journals!](#)

Here are a few suggestions:

- Leaf and tree rubbings
- Sketches
- Watercolor paintings or with crayons
- Poetry
- Lists of birds, flowers and insects you have observed.
- Photograph or draw a tree to observe how it grows and what grows around it.
- Other photographs
- Record animal tracks seen on a nature walk.  
Try to identify them at the Pavilion.



Here are many other [Nature journaling ideas](#). [Here is a link to Nature Blogs!](#)

## What should the students and I bring?

Bring a field bag with binoculars, a magnifying glass, notebooks, pencils, and map for the paths.

- Notebooks – many different types: sketch books, water color pads, homemade books.
- Clip board to attach loose paper and later added to a binder
- Pencils, sharpener, erasers
- Watercolor crayons without the labels
- Pastels
- Guides of what could be seen in the forest
- Camera



**Did you know?** Scientists, naturalists, philosophers such as John Muir, Henry David Thoreau, Ralph Waldo Emerson and Rachel Carson kept journals of their observations, poems, and discoveries. Books are published from their journals.  
<https://www.plt.org/educator-tips/nature-journaling-ideas/>

## Nature Journaling Suggested Activities

These suggestions are from “Keeping a Nature Journal” 2<sup>nd</sup> Edition by Clare Walker Leslie and Charles E. Roth, 2000.

### The Living Camera

This activity combines observation and trust. The teacher creates pairs of students. Have the students roam a trail or meadow for about five minutes as they search for something that catches their eyes, such as an insect on bark, an unusual plant, an interesting leaf shape, or an animal track in the ground. Then, each student sits for five minutes and describes the object in the journal as a narrative, poem or whatever he or she chooses. Then, have one partner wear a blindfold or close his or her eyes while the other partner guides the partner to the object. The partner removes the blindfold or opens the eyes to observe the object. The partner looks to remember everything about the object. No one talks about the object. Then, the partners switch roles and observe the other object.

When both partners have seen each other’s object, they add to the original descriptions of the objects in their journals. When the writing is completed the partners exchange journals and compare what they saw as “living cameras.”

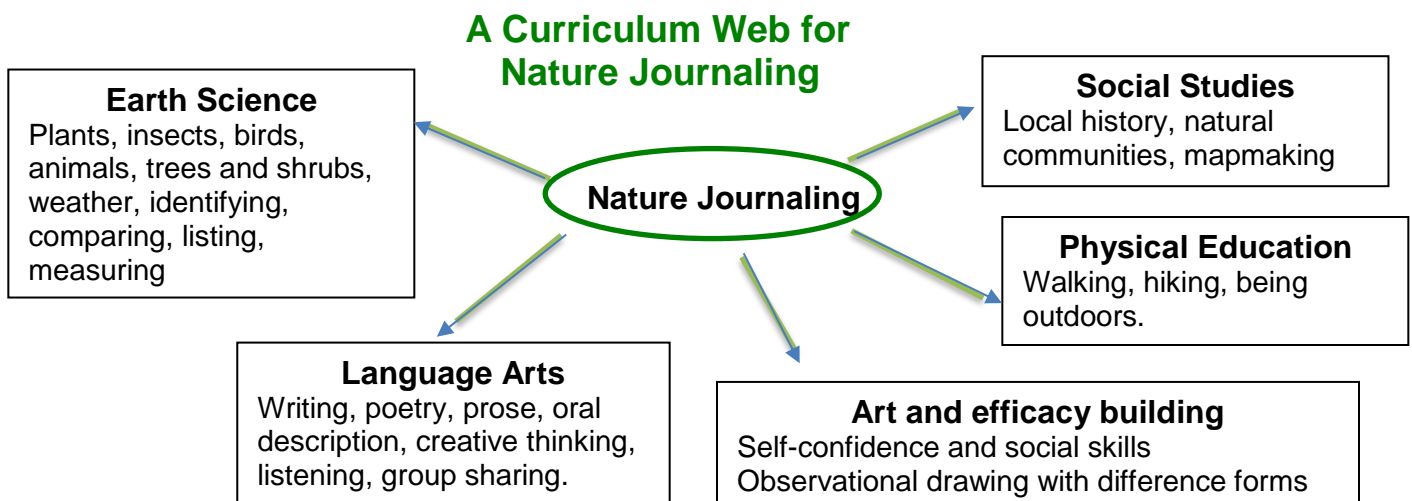
### The Observers’ Circle

As a group or multiple groups, have the students hold hands to form a large circle. Then, everyone drops hands, turns around, take ten paces forward (or as much as possible). Then, everyone sits down for fifteen minutes and record everything they see, hear, smell, and feel. But no talking! The observations in their journals can include words, drawings, or both.

After the time period, have students return to the circle and share the diversity of their experiences with each other and celebrate nature with everyone!

### Create Study Plots

Share examples of nature journals from John Muir, Rachel Carson or others. Choose trails to visit. Have groups stay in an area for ten minutes as they choose their individual place to observe. Ask students to choose a direction like North, South, East and West, then make journal entries of what they see, hear, smell and feel. At the end of the time, have the students share if they were writing or drawing or both. It is important to affirm that all those ways are valid so students feel comfortable with their choices and skill levels. Be sure that you also create journal entries to share.



**Did you know?** The word “ecology” comes from the Greek word that means “household or home.” So, ecology is the study of our natural home.

<http://ecologyandenvironmentmanagement.blogspot.com/2014/02/003-basic-ecological-concepts.html>

## History of the Pfeiffer Nature Center



The Pfeiffer Nature Center was established by Wendy Pfeiffer Lawrence to honor her father, Timothy N. Pfeiffer. The Nature Center is located in the Portville community where her mother, Eleanor Knox Wheeler, was born and raised.

From her birth in 1925, Wendy grew up spending summers in the village and around the countryside of Portville. In the early 1940's her father built the chestnut [cabin](#) on land overlooking 'Griffin' valley and thus more excursions into the woods and meadows "up [Lillibridge](#)" by family, friends and visitors began.

For over seven decades Wendy spent some of every year in the area, for most of that time with her husband Clive Lawrence. In the twenty years (after the death of her father) from 1971 to 1991 they looked forward to living at the cabin during the summer and early fall months.

Wendy loved to walk the woods. She believed in the inherent pleasure, value and aesthetics of quiet immersion in a forest. Her hope was that such experiences by visitors to this place would instill an appreciation that is similar to her own and her family.

In 1998 the Pfeiffer Nature Center and Foundation was established. It consists of the 188 acres of property donated by Wendy Pfeiffer Lawrence. In 2002, an [additional 460 acres](#) were added to the Nature Center due to the generosity of Colonel Charles Eshelman.

Pfeiffer Nature Center is a member of the [Association of Nature Center Administrators](#), the [Greater Olean Area Chamber of Commerce](#), and is located in the heart of the [Enchanted Mountains](#).

Located in a rustic setting on a man-made plateau with an unparalleled view of the valley and hills to the west, the Pfeiffer-Wheeler family America Chestnut log cabin was constructed between 1939 and 1941 to provide the family a summer retreat where they could enjoy this beautiful spot.

The log cabin has strong visual references to traditional great camp notions of the late 1800's. The floor plan is a symmetrical "T" with a great room across the front, taking advantage of the spectacular view to the west.



Enter the great room and step into a glimpse of the past. You can see most of the family's furnishings from the 1940's in the cabin. The room has a beautiful open gabled pine ceiling and walls of untreated chestnut. A large oversized rustic fireplace constructed of fieldstone from the property anchors the great room. The floor is constructed of slate from the Village of Portville. Gaze through the large picture window on a vista that spans twenty-two miles to Allegany State Park.

The cabin and site were listed in the National & State Registers of Historic Places in January 2002 in recognition of its significance in American history and culture.

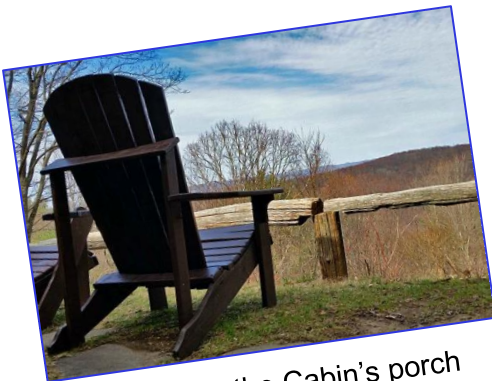
## Historical Role Play Activity

The area that you are about to visit has meant many things to many different people over the years. A Seneca Indian would have viewed the area quite differently from a Surveyor, or a botanist wanting to discover nature, or young people looking for a place to visit in the 1800's.

Have students research and adopt one of the perspectives below and have them role play as that person during your visit. The different historical roles would see, hear, smell, and touch things differently. Have students take pictures to tell a story as a role they are playing. Like any inquiry-based exercise, role-playing needs to be followed by a debriefing for the students to define what they have learned and to reinforce it.

### Become someone who has an interest in Pfeiffer Nature Center:

- A Botanist
- An Environmental journalist
- A Geologist
- A logger seeking lumber to use when building
- A photographer who loves nature
- An artist who paints images of nature
- A writer who creates stories of nature



View from the Cabin's porch



The Cabin

### Before your visit . . .

- Discover your students' learning styles that meet [Howard Gardner's Multiple Intelligences](#).
- Have students read the list [in this link](#) and identify which they most identify with for the visit.
- Have students research the history of the area.

### During your visit: Have students . . .

- Pretend to be their chosen role throughout the field trip. Have them explore the Nature Center with others while sharing that role.
- Ask questions of themselves and others in their groups.
- Keep a written or photo journal of their discoveries.

### After your visit: Have students . . .

- Engage in a **Think-Pair-Share** activity.
- Think about their experience and write a short descriptive paragraph.
- Pair with another student or group to share and compare their experiences.

## Discover Bluebirds at Pfeiffer Nature Center New York's State Bird

### Facts about bluebirds: [Eastern Bluebird - Watchable Wildlife](#)

70 years ago, [bluebirds](#) were among the most common songbirds in America.



They are liked by farmers because they eat insects. Populations of bluebirds fell in the early 1900's when European starlings and house sparrows took over the available nest holes and made it difficult for bluebirds to hold on to them.

Creating bluebird trails and nest boxes gave new homes to the bluebirds.

**There are several blue bird boxes in the field behind the Pavilion.**

**A pair of bluebirds lives in a box each year.**

**Look for them and take a picture of them.**



**Habitat:** Bluebirds live in meadows and openings surrounded by trees that offer suitable nest holes.

Original habitats included open, frequently burned savannas, beaver ponds, open woods and forest openings.

They live across eastern North American and as far south as Nicaragua.

**Why are bluebirds blue?** Blue birds are not really blue. They do not have any blue pigment. Unlike many other bird colors, blue is a color produced by the structure of the feathers. Instead they use a very cool trick called [light scattering](#). It is similar to how a prism works. Tiny air pockets and melanin pigment crystals in each feather scatter blue light and absorb other wavelengths. The even finer structure of the feather gathers the bouncing blue wavelengths together and directs them outward.

**Color patterns:** **Males** are vivid, deep blue above and rusty or brick-red on the throat and breast. Males often look plain gray-brown from a distance.



**Females** are grayish above with bluish wings and tail, subdued orange-brown breast with a distinct eye-ring.

**Juvenile** bluebirds have a striking spotting or scaling on the breast and throat.



**Behavior:** Bluebirds perch on wires, posts, and low branches in open country.

Look for them as they make short, hovering flights low to the ground to pick an insect, or hover and pick berries from a bush. Males sometimes fly over territories and chase each other at high speed.

**Food:** Insects on the ground are the main sources of food. In the fall and winters, they eat large amounts of fruit including mistletoe, blackberries, black cherry, wild holly, honeysuckle and currants.



**Did you know?** Bluebirds can reach speeds up to 17 miles per hour in flight. They can spot an insect on the ground from 60 feet away. Bluebirds are family-oriented birds with the female who builds the nests. <http://www.sialis.org/eablbio.htm>

## Build a Bluebird Box

### Directions:

Cut the top piece of the nest box, 11 1/4" x 11". Cut the two side pieces.

Drill 5/8" vent holes 1" down from the top and 2" in from each side. Toward the top of the front edge, and 3/8" in, drill a 1/8" hole for a nail or a screw.

Cut the front of the box, 5 1/2" wide and 9" long, with an entrance hole that is 2-1/4" hole for eastern bluebirds whose center is 2" from the top and 2 1/2" from each side. Cut the roof, back and floor.

Using the chisel, cut crisscross scratches on the inside of the front panel. These will allow young birds to climb to the entrance hole and emerge.

Glue and nail the side pieces to the back. The sides should align with the top of the back. The roofline should slope toward the front of the birdhouse.

Glue and nail on the bottom of the birdhouse, recessing it 1/2" from the bottom of the side pieces.

Attach the front of the birdhouse with two nails, through the 1/8" holes drilled earlier, near the top of the side pieces. (This will allow the front to swing open for cleaning.) Put a screw into the bottom to secure the front. Leave a gap of 1/2" at the top of the front for ventilation.

Glue and nail the roof on, leaving an overhang to the sides and an overhang on the front. Seal the crack at the top rear of the birdhouse to keep the rain out.

**Time:** Variable. Good for middle to high school students. Want to do something that's good for bluebirds and is fun? Build them a nesting box!

You'll be charmed by the birds' beauty and cheerful singing.

### Materials:

You can use a variety of woods and plywood as long as they are weatherproof and not pressure treated. Pine or cedar boards, exterior plywood, even hardboard house siding can be used. You can stain or paint the outside of your bluebird boxes a light color (gray or brownish gray), but always leave the inside and the edges of the entrance hole unfinished.

Standard board 1" x 6" x 4' long

Standard Board 1" x 10" x 10 1/2" long (roof)

20 - 1-3/4" galvanized nails or screws

2 - 1-3/4" galvanized nails for pivot point

Double-headed nail for holding door closed

### Tools:

Tape measure

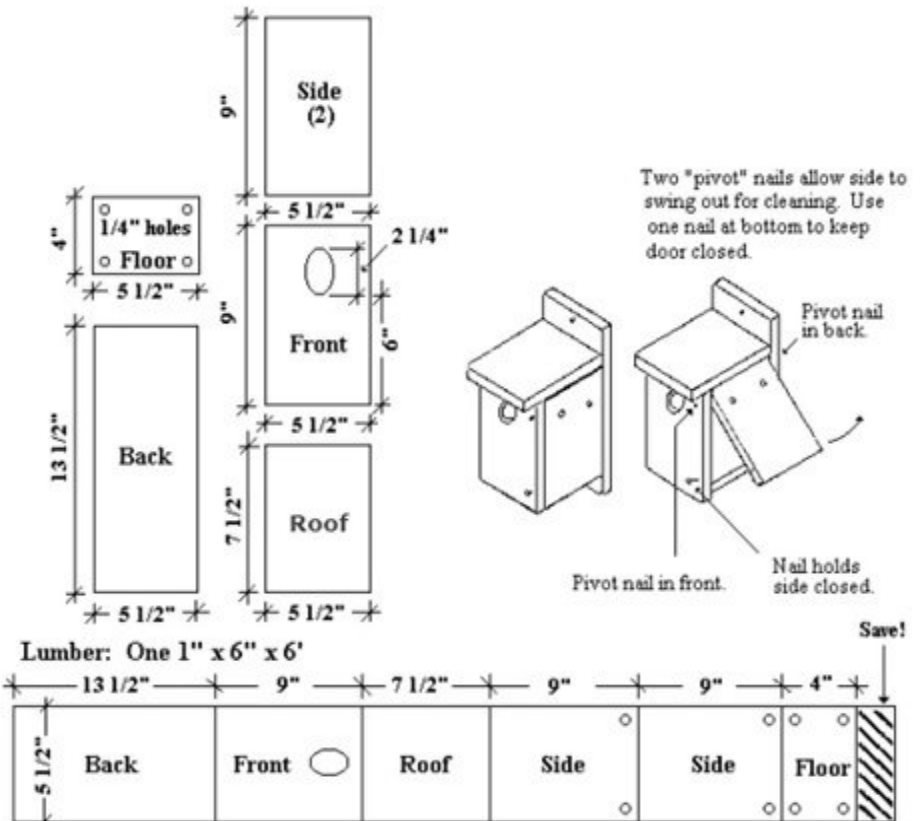
Hand or miter saw

Sandpaper

Chisel

White Glue

### One Board Box





## Think like a Scientist!

**Time:** 45 to 60 minutes. This is excellent for all ages.

### Objective:

Students will describe the flow of energy and matter through food chains and food webs. Students will pose questions that use the “Scientific Method” and require observation and/or research. Students identify relationships between organisms based on the food an organism eats.

### Questions to ask when creating a food chain from observations at Lillibridge:

How does energy flow through a food web?

How do organisms interact with each other and with the environment in which they live?

How many organisms do you see?

Label each organism as a [producer, consumer, scavenger, autotroph, or heterotroph](#).

Describe the role a [decomposer or detritivore](#) might have in a food chain. What do you see?

How many Carnivores? Herbivores? Decomposers do you see at Lillibridge?

How many can be involved in your food chain? Label them as a Carnivore, Herbivore, Decomposer.

Here is a chance to practice and know the vocabulary before students create their Food Web.

**Question:** What did they discover about how energy is transferred from one organism to another?

### LABEL THE FOOD WEB

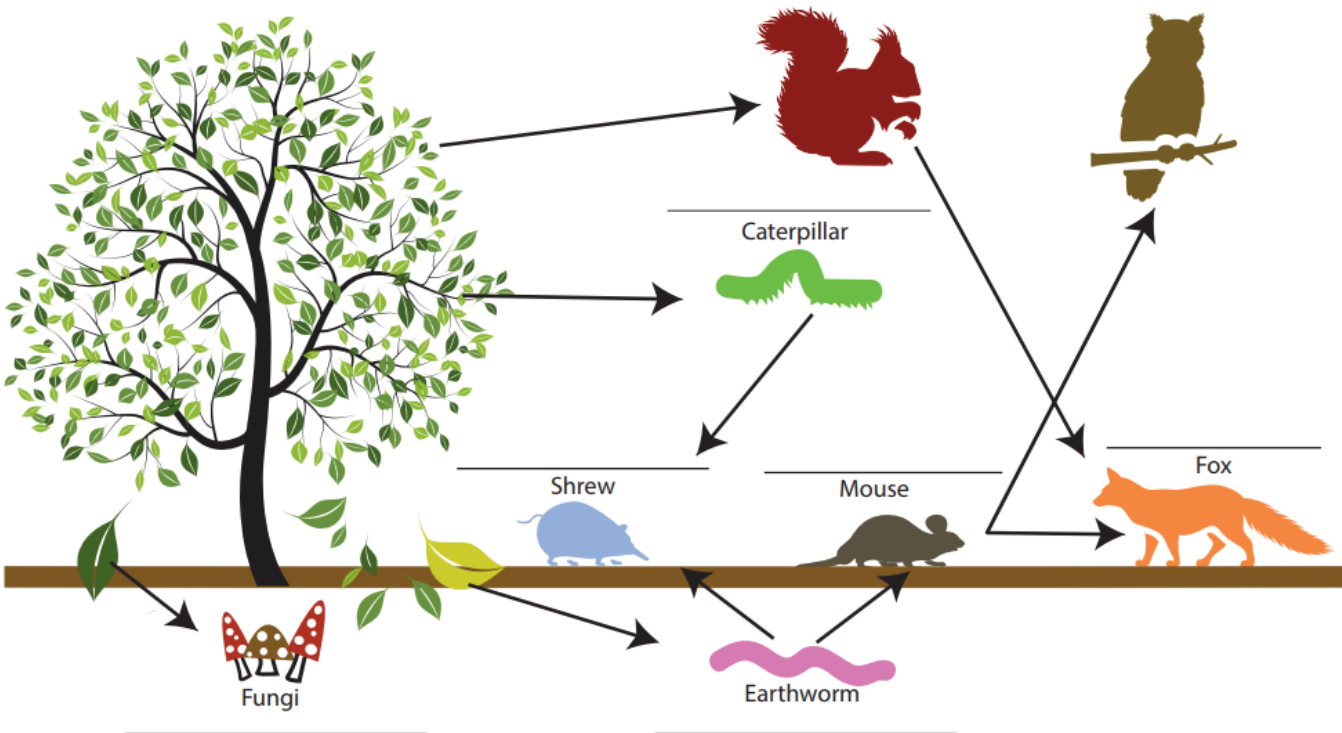


Label each organism based on its position in the food web:

**P** = Producer, **1** = Primary Consumer, **2** = Secondary Consumer, **3** = Tertiary Consumer,  
**D** = Decomposer (Some may have more than one label).



Then label each animal as **H** = Herbivore, **C** = Carnivore, or **O** = Omnivore.



To gain a deeper understanding of [trophic levels](#), the teacher could continue with lessons on the amount of energy gained from each trophic level and explain how energy is lost between levels.

The teacher could also share [biotic and abiotic factors](#) in the environment that have significant effects on the development of the organisms in the area (such as predators, temperature, and precipitation).

# What is Biodiversity?

Lesson developed by Mélissa Garrigue and Réjane Limet

<http://www.inquirebotany.org/uploads/files/The%20INQUIRE%20lesson%20plans.pdf>

## Overview:

Help students understand biodiversity and the impact human being can have on it. To help them understand the complexity of this concept, they are asked to study an ecosystem and to measure the biodiversity as well as explore the interrelationships characterized within it.

## Objectives:

Students understand the concepts of 'biodiversity' and 'ecosystem'.

Students recognize that natural habitats are dynamic systems which are often put under a lot of pressure / threats.

Students recognize the impact (negative and positive) that humans have on ecosystems.

Students use their food chain. They will also discuss different relationships that exist in an ecosystem, discovering that those relationships may be very complex.

## Part 1: What is an ecosystem?

Students are not told that these are ecosystems (This word is used later). The Teacher divides the class into two and gives each group one of the areas to study in more depth. Give students 15 minutes to focus on observing and recording the different components of their area (living and non-living things). They are to consider the interrelationships between the components. Ask students: "What can you see?"

Each group presents their findings to the other group. The teacher introduces the term "ecosystem" and shows evidence of the abiotic and biotic parts of an ecosystem with the students (posing questions such as: 'What do plant needs to grow?'). Students use evidence from their observations to answer this question.

The teacher explains that the students have completed a study on the interrelationships of an ecosystem (with both **biotic and abiotic** components), emphasizing the complexity and diversity of species and components within it. The teacher modifies one ecosystem web (e.g. removing a key species / changing an abiotic component etc.) and asks what can cause these modifications and how this might impact on the area. The educator should emphasize the importance of the balance required within an ecosystem and how fragile it is.

## Part 2: Game to understand biodiversity loss.

Explain that the game is an adaptation of musical chairs.

The drawings are set up in a circle (one drawing per student).

The music is turned on and students walk around the drawings. The teacher takes one drawing out—representing the loss of a species.

When the music stops, the students sit on the drawings.

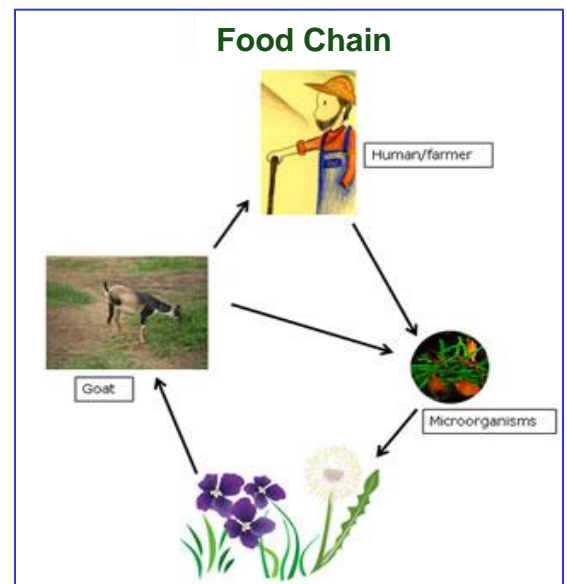
The student left standing is taken out of the game.

The teacher shows the picture of the 'extinct species' and asks the students "what could have made this species go extinct?"

Student who is "extinct" has 30 seconds to consult with others then report the conclusions.

The students all stand again and the music is started. This procedure is continued for several rounds. Ask what would happen if there was only one species remaining.

Finish with a discussion on species extinction and a brainstorming session on what students can do to reduce and eliminate biodiversity loss.



# Taxonomy

**Time:** 45 to 60 minutes. This is excellent for all ages.

## Introduction:

[Taxonomy](#) is the branch of science concerned with classification, especially of organisms; systematics. The [6 Kingdoms of Biology](#) identify the features used to classify organisms. These characteristics range from very broad to very specific. This activity will familiarize students with the [taxonomic levels by Carl Linnaeus](#) and [flashcards](#). Have fun with this [Animal Classification Game](#).

## Taxonomy

- ▶ This system was created by Carl Linnaeus or *Carolus Linnaeus*
- ▶ Seven taxonomic levels each called a taxon.
- ▶ Kingdom ▶ King
- ▶ Phylum ▶ Phillip
- ▶ Class ▶ Came
- ▶ Order ▶ Over
- ▶ Family ▶ For
- ▶ Genus ▶ Great
- ▶ Species ▶ Spaghetti



## The Six Kingdoms of Life



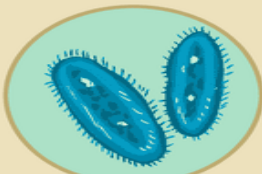
Animalia



Plantae



Fungi



Protista



Eubacteria



Archaeobacteria

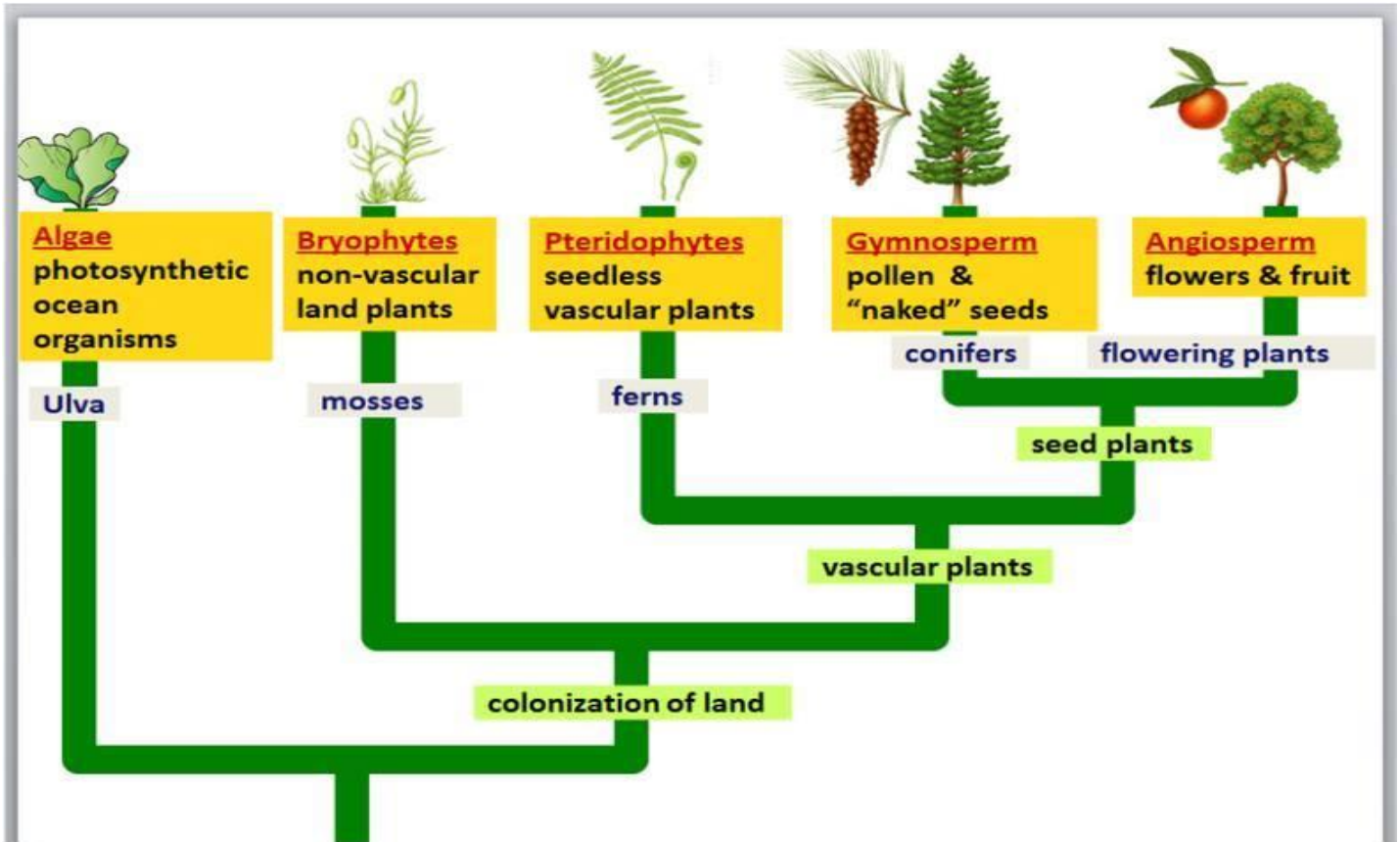
# Plant Kingdom

## Materials:

Journal and pencil, [Animal Kingdom Chart](#), [Plant Kingdom Chart](#), Classification tables

## Directions:

Have students sit for 5 minutes without talking. During this time, they write down as many species that they can identify by looking at the environment. After 5 minutes, have students share their observations and notice what other students saw. In the classroom, they complete the tables



[Bryophytes](#) are an informal group consisting of three divisions of non-vascular land plants, the liverworts, hornworts and mosses. They are characteristically limited in size and prefer moist habitats although they can survive in drier environments.



[Angiosperms](#) are plants that have flowers and produce seeds enclosed within a carpel. The angiosperms are a large group and include herbaceous plants, shrubs, grasses, and most trees.



[Pteridophyte](#) is a member of the Pteridophyta, a division of plants including the ferns and their allies (horsetails, club mosses).

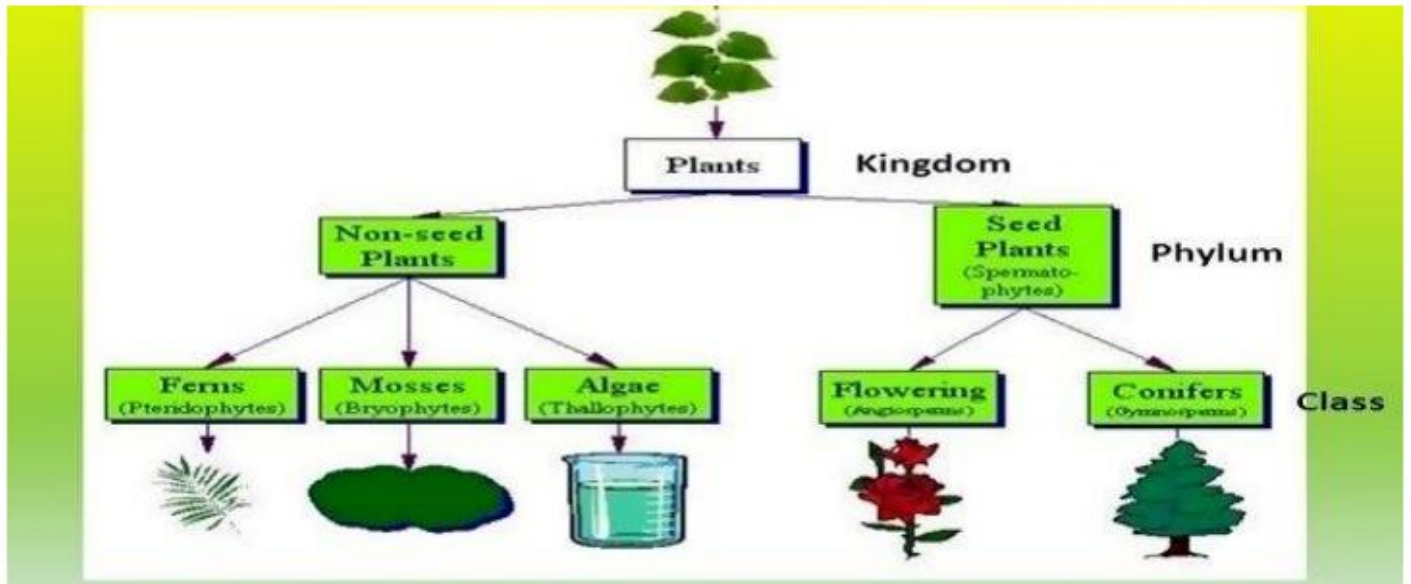
## Explore the [Evolution of Plants](#)



**Did you know?** Mosses were often used in the 18<sup>th</sup> Century to stuff mattresses. One moss called "Hypnum" is derived from the Greek word meaning "sleep."

<http://bryophytes.plant.siu.edu/PDFfiles/Bryo-poster%201.pdf>

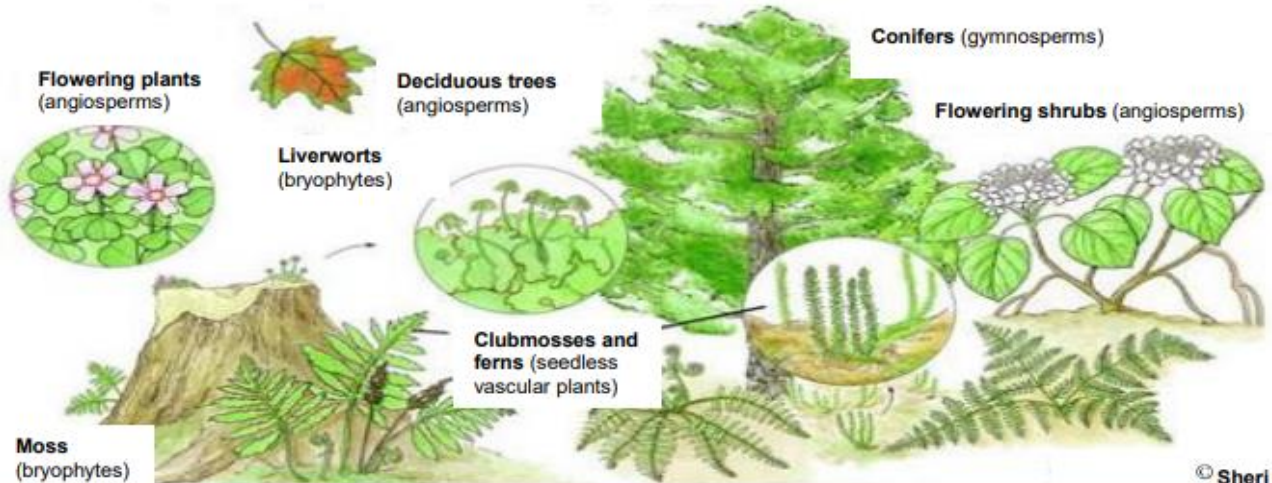
## Classification of Plants at Pfeiffer Nature Center



### The Characteristics of Plants

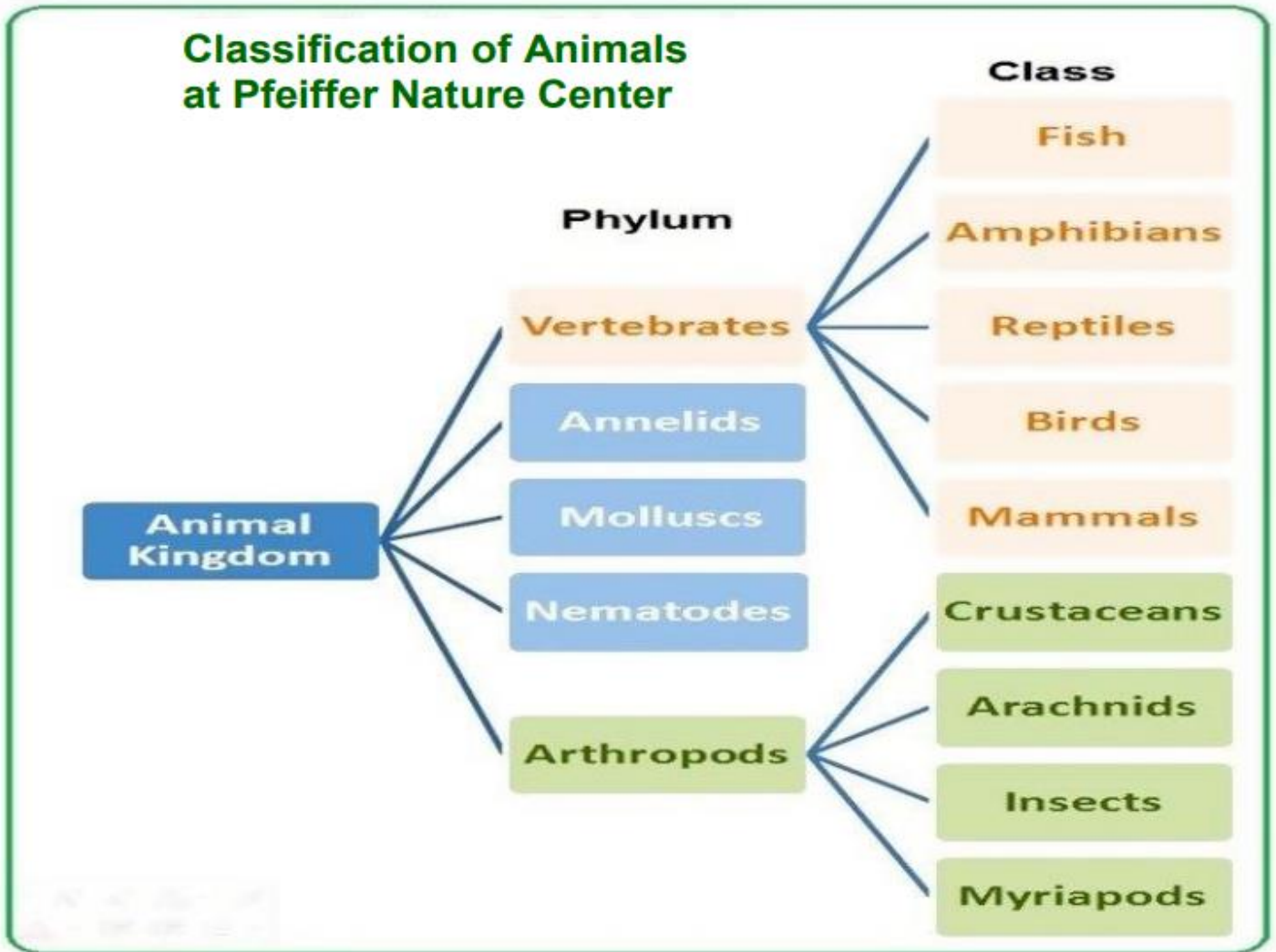
Vascular plants are broken down into 3 groups:

- 1) Seedless vascular plants (ferns, horsetails and clubmosses)
  - 2) Naked seed vascular plants (conifers, cycads, and ginkos) – gymnosperms
  - 3) Protected seed vascular plants (flowering plants, grasses and deciduous trees) – angiosperms
- Nonvascular plants (mosses, liverworts and hornworts) – bryophytes



© Sheri Amsel

Observed Plant / Vascular or Nonvascular	Phylum	Class	Protected Seed
1.			
2.			
3.			
4.			
5.			



Observed Animal	Phylum	Class
1.		
2.		
3.		
4.		
5.		

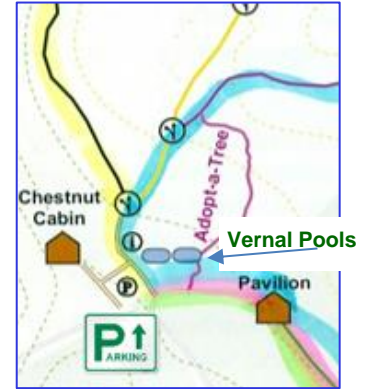
**Characteristics of Plants & Animals**

<https://sciencing.com/characteristics-plants-animals-5491852.html>

# Discover Vernal Pools at Lillibridge

**Time:** 30 minutes to 1 hour. Good for all ages.

**Vernal pools** are temporary wetland habitats that have no permanent inlet or outlet of water flow. The word “vernal” means “of or in spring”, and vernal ponds fill with rainfall, snowmelt, and thawing ground water early in the year. These pools are home to creatures adapted for both aquatic and terrestrial habitats at different life stages.



An advantage is the absence of fish, which feed on eggs and larvae. While observing the vernal pools at Lillibridge, students may see reptiles, amphibians, and invertebrate species. The time of year will determine what life stages are likely to be seen.



Marbled salamander

**Essential Question:**

Why and how is energy transferred among organisms in ecosystems?

**Objectives:**

Students describe the purpose and characteristics of a Vernal Pool.  
 Students explain the basic biochemical processes in living organisms and their importance in maintaining dynamic equilibrium.

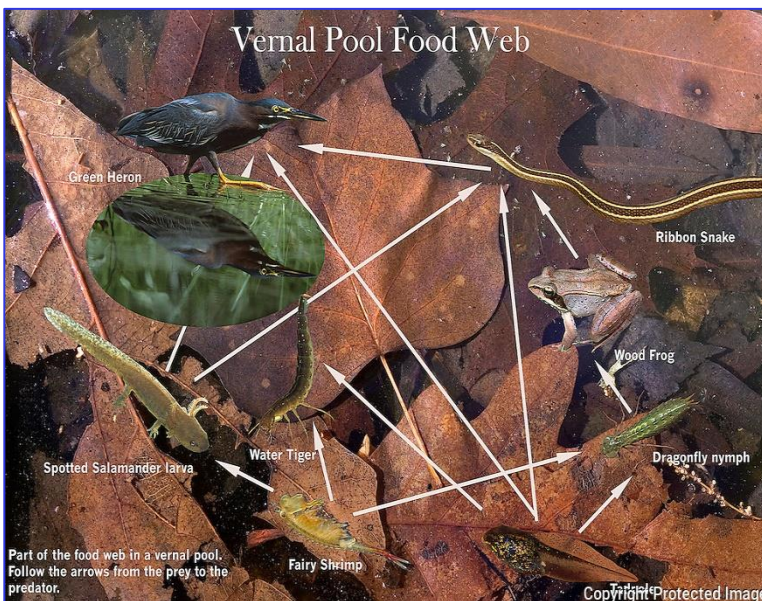
**Materials:**

- Nature Journal, pencil, and smartphone to take photos [Check this link to The Vernal Pool Association](#)
- Food web worksheet
- Food chain images

**Topics to familiarize students with before visiting Lillibridge vernal pools:**

- [Primary and secondary consumers](#)
- [Carnivores, omnivores, and herbivores](#)

- [Decomposers/detrivores](#)
- [Scavengers, autotrophs, heterotrophs](#)



**Directions:**


Introduce students to vernal pools and its inhabitants before visiting the Nature Center. A list of species commonly found at or around vernal pools is at this website - [Vernal Pool Animals](#). Pictures can be displayed in the classroom and reviewed before visiting the center.


When viewing the vernal pools, have students observe and record at least 3 plants and animals around the area. Then create [a food chain](#) based on what they know about how energy is transferred from one organism to another. A [food chain](#) shows how living things are connected by what they eat. To live, plants and animals need energy.


The teacher should state that ecologists use arrows to show the direction that energy flows and how chemical energy can be transferred from one organism to another. Have students give a 2-3 minute presentation of their food web or hang food web posters around the room as a Gallery Walk.

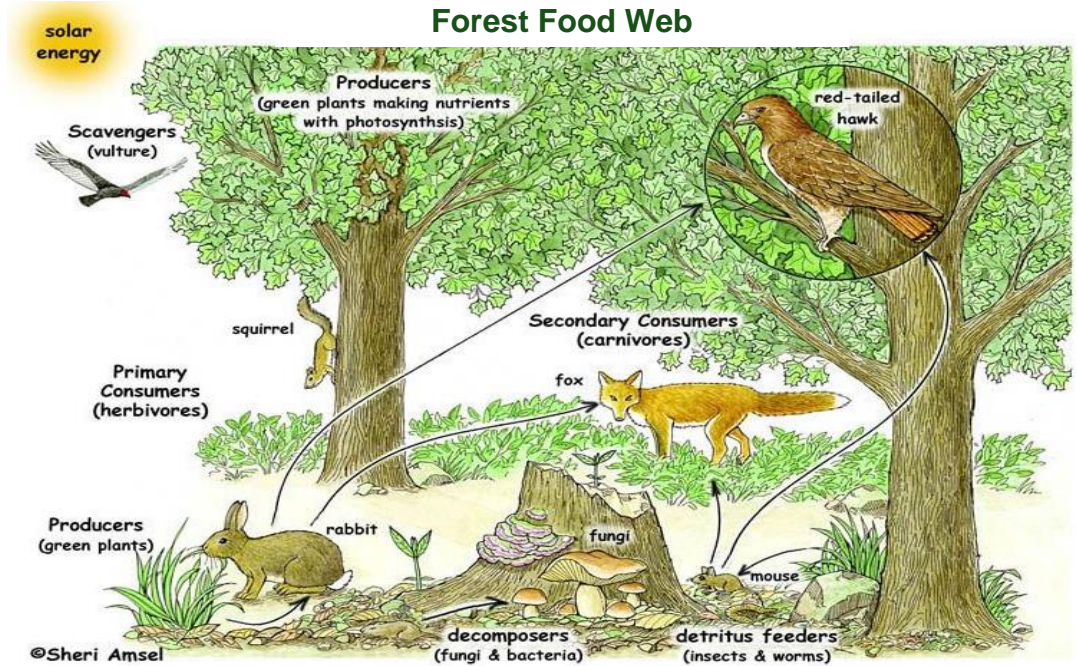
## Energy Flow through the Ecosystem at Lillibridge

Here is an example of a [Deciduous Forest Food Web](#) you might see at Lillibridge. You can compare what is in this web with the species at Lillibridge. You could create one like this or use circles and arrows (like in the example) to show interactions that create energy at Lillibridge.

 In small groups at the Pavilion, have students arrange what they saw in several circles that show the flow of energy between the organisms. Include animals, pellets, plants/seeds, and invertebrates.

 Now, ask students to draw arrows showing the flow of energy as they create their own food chains/food webs.

 At the Pavilion, look at the footprints around its edge and identify the animal that would make that footprint. Show where the animal is located on the food chain or food web. As students build overlapping food chains, the circles will start to look like a web. Have students share their food webs and discuss what they see at Lillibridge. They can use this Graphic organizer with their notes.



**Questions:** Did student use any species multiple times? Any species that students did not use?

Word	Description/Definition	Example/Picture
Producer		
Consumer		
Herbivore		
Omnivore		
Carnivore		
Decomposer		



## Ecosystem Interactions

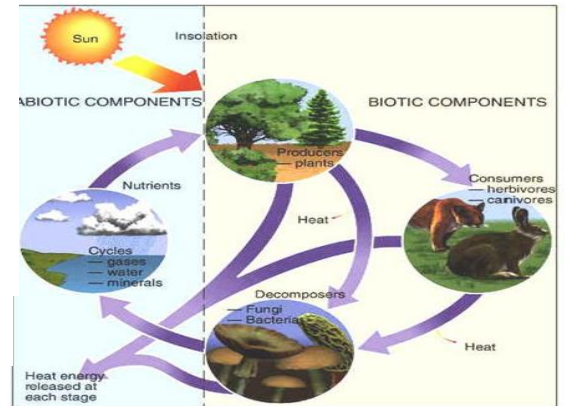


### Ecosystem – Biotic and Abiotic

Ecosystems are made of up living and non-living components.

These components are referred to as biotic and abiotic factors.

While they are considered separate, they act upon one another in often complex ways.



**Time:** 30 minutes. This activity is excellent for all ages.

#### Objectives:

Students correctly use the terms “Biotic and Abiotic” and other terms in discussions and reflections. Students describe sources of variation in organisms and their structures and relate the variations to survival.

#### Materials:

Nature Journal, or checklist, ecosystem factors table.

#### Question:

Have students describe three things that could happen if a new organism is introduced. How would the organism affect the ecosystem or animals in their food web?

#### Directions:

Encourage students to refer to the lists of common plants, mammals, birds, and amphibians found at the Lillibridge property or use this [Link to the Species List in the Resource Guide Appendix](#) and write down in their journal the ones they find. Students may include insects.

At the Pavilion or when returning to the classroom, students can fill in the **Ecosystem Table** on the next page listing Biotic and Abiotic factors in the environment that they observe. Discussion can include interactions between the plants and animals observed, including [competition and predation](#).



Explain that an ecosystem consists of both biotic and abiotic factors. In an ecosystem, biotic factors include all the living parts of the ecosystem. A healthy woodland ecosystem contains producers like grasses and trees, as well as consumers ranging from mice and rabbits to hawks and bears. The **biotic components** of an ecosystem also encompass decomposers like fungus and bacteria. A healthy aquatic ecosystem includes producers like algae and phytoplankton, consumers like zooplankton and fish, and decomposers like bacteria. The **abiotic factors** in an ecosystem

include all the nonliving elements of the ecosystem. Air, soil or substrate, water, light, salinity and temperature all impact the living elements of an ecosystem.



**Did you know?** Algae have chlorophyll and can manufacture their own food through the process of photosynthesis, producing oxygen which enters the atmosphere. <https://www.encyclopedia.com/plants-and-animals/microbes-algae-and-fungi/moneran-and-protistan/algae>

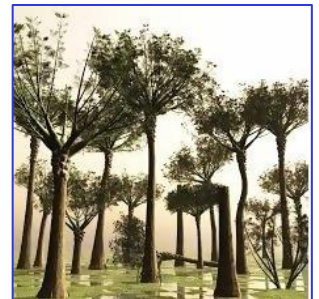
## Ecosystem Table

A great resource to explore – [Ecology by Inquiry](#) by Kathryn Kelsey and Ashley Steel

Ecosystem	Biotic Components	Abiotic Factors
Temperate Deciduous Forest		
Vernal Pool		
Rotting Log		
Open Meadow		
On a Trail (Name the trail)		



**Did you know?** The oldest known tree ancestor was a leafless, fern-like plant known as [Wattieza](#), identified from 385 million-year-old fossils. Two fossils were found near **Gilboa, New York**. Part of a prehistoric plant family thought to be ancestors of ferns, it stood 26 feet tall and formed the first forests. It lacked leaves. Instead, they grew branches with "branchlets" resembling a bottlebrush.  
<https://tree-care.com.au/eight-fascinating-facts-about-trees/>



**[The Gilboa Museum](#) - Devonian Forest Fossils!**

## Discover the Plants at Lillibridge

### Do Plants Breathe?

When you breathe, the action is easy to see because your chest expands. Exhale against a window and you can see the water vapor. How about plants? Do plants breathe? Well...not exactly. Plants utilize carbon dioxide and sunlight and produce oxygen through a process called photosynthesis. This simple activity will provide visual proof that plants are producing the oxygen we need to survive.

### Time:

30 minutes to 1 hour. Good for all ages

### Objectives:

Students identify simple, compound opposite and alternate leaves.  
Students describe their findings to others about respiration.

### Materials:

Zippered plastic bags, access to a variety of plants, a sunny day.

### Directions:

#### What leaves do your students see?

- **Step 1.** Find several plants for the experiment. Try to select a variety of plants such as a vine, a shrub or tree or flower. You can also choose a plant with red leaves vs green leaves or select plants with leaves of different sizes. Remind students they are not picking the plant or removing any of its leaves so choose something that they can slip a bag over without damaging the plant.
- **Step 2.** Working with your first plant, place the bag over the plant, or a portion of the plant, and zip the bag as far closed as possible without damaging the plant. Students won't be able to close the bag completely, but that's okay.
- **Step 3.** Repeat Step 2 with several more plants.
- **Step 4.** Come back in 20 or 30 minutes. What do students see? If they don't see anything, wait for another 20 or 30 minutes. This step can take different lengths of time depending on the type of plant and the temperature outside. The droplets condensed inside the bag are water—evidence of the plant's respiration process!

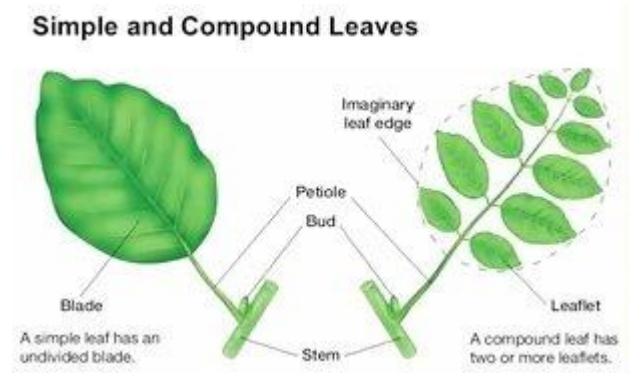
Expand by repeating it at different times throughout the year. Do they get the same results in the fall? How about during the winter? In winter weather, many plants die while others go dormant. Does a dormant plant's respiration process still generate water vapor? Experiment to find the answer.

### Simple and Compound Leaves:

In North America, most broad-leaved trees are deciduous. If a leaf comes from a deciduous tree, it can be one of three types: simple, lobed or compound. Simple leaves are the easiest to identify. They have an oval, round, heart or triangular shape. Some simple leaves have indentations on the outside edge. These are called lobed leaves. Examples of simple lobed leaves are maples and oaks.

### Opposite or Alternate:

Once the leaf type has been determined to be simple, next notice the pattern in which the leaves are arranged on the twig. If they are attached directly across from each other, they are called simple opposite leaves. Leaves attached in an alternating pattern are called simple alternate leaves.



## Discover the Trees at Lillibridge

### Create a Bark/Tree Journal

**Time:** 30 minutes. This is good for all ages. It draws participants in, working on observational and analytical skills. Look for these tags on trees along the trails.

#### Objectives:

Students create bark rubbings and purpose of bark.  
Students note the name of tree, the type of bark and leaves.

#### Materials:

Paths with Trees  
Plain white paper and crayons with covering removed  
Masking tape  
Nature journals

#### Directions:

Look for several different trees with tags or without tags along the trails.

- Close your eyes and feel the bark. How does it feel? What do you notice?
- Open your eyes and read the tag.
- Use tape to hold the paper on the trunk tightly. Then, lightly rub a crayon horizontally over the surface of the paper on the bark, just hard enough so the bark's texture shows on the paper.
- Take the paper, label it. Put in your journal.
- Do this with several trees and note the name of each tree on the tag, if there is one.
- Write brief descriptions of what you discover. What type of bark is it? How could that help or protect the tree?



Explore the "[Language of Bark.](#)"

What do you discover about the bark of the trees? Discuss the properties of the bark and how they might be beneficial to the tree.

As you look closer, you'll see that trees are all different from each other. Compare and contrast to find the differences. The basic types of tree bark are:

Smooth

Furrowed such as a black walnut

Scaly like on a longleaf pine

Plated which looks like scaly bark but is larger

Warty, and shaggy which are long and loose

Fibrous which are furrowed and papery.

# Adaptations

## Introduction:

[Here is an excellent website to introduce adaptations.](#)

This activity is great to help students grasp the concept of adaptations by differentiating between specific features and allowing students to see how they are necessary for the organism's survival in their natural environment. While this activity focuses only on organisms in the **temperate deciduous forest biome**, it is sufficient for teaching the significance of [adaptations](#) and their role in an organism's survival.

(\*Note: this activity focuses on **structural adaptations**. If you want to also cover **behavioral adaptations**, it is suggested that you add a research component – perhaps turning this into an entire project – as you would need several more hours at the nature center to gather enough observational data.)

## Key concepts:

How does an organism's appearance and characteristics help it survive in its environment?

How do adaptations relate to **natural selection**?

## Objectives:

Students will practice their scientific rationalization, observation, and recording skills

Students will recognize the significance of the specific designs of plants and animals and understand how an animal's adaptations impact natural selection.

## Materials:

Pen/pencils/markers

Nature journal

Graphic organizer worksheets

## Directions:

In their Nature Journal or using the Graphic Organizers have students draw some of the plants and animals they see at the Nature Center. Instruct students to record anything they notice about these animals as well (ex: is the squirrel climbing a tree? Is the flower pink or white? Is the moss on a rock or on the ground?)

When at the Pavilion or after returning to school, have students choose from the organisms they found (the number of organisms is up to you) and identify the **adaptations** of each organism using the Graphic Organizers. Have students list a few adaptations *and* briefly explain how they help the animal survive and/or reproduce.

### Types of Adaptation

Anything that helps a species survive in its environment is an adaptation.

It also refers to the ability of living things to adjust to different conditions within their environments.

- ❖ **Structural adaptation**
- **Protective coloration**
- **Mimicry**
- ❖ **Behaviour adaptations**
- **Migration**
- **Hibernation**



**Did you know?** More than a century ago, nearly 4 billion American chestnut trees were growing in the eastern U.S. They were among the largest, tallest, and fastest-growing trees. The wood was rot-resistant, straight-grained, and suitable for furniture, fencing, and building. The nuts fed many birds and animals. It was almost a perfect tree. The tree was nearly lost in the late 1930's due to the chestnut blight. Work is currently being done to restore the trees to their former glory!

<https://www.americanforests.org/magazine/article/revival-of-the-american-chestnut/>

# Plant Graphic Organizer

Plant: \_\_\_\_\_ Student: \_\_\_\_\_

**Describe the plant you saw and its features that help it survive.**

Plant sketch

Protection (thorns, bark, poison, etc.)

Reproductive method (flowers, cones, etc.)

Adaptations to live in the environment

Structure (tall stem, no stem, many leaves, roots/no roots, etc.)



**Did you know?** Plants' ability to adapt quickly to varied and unique circumstances has enabled plants to inhabit some of the most unlikely of habitats and utilize unique ways of gaining nutrients. When one thinks of plant locations, soil and water come quickly to mind. However, plants also take to the air. Plants have evolved to inhabit air spaces by growing on other plants and objects. <http://www.mbgnet.net/bioplants/adapt.html>

# Animal Graphic Organizer

Animal: \_\_\_\_\_ Student: \_\_\_\_\_

**Describe the animal you saw and its features that help it survive.**

Animal or Reptile sketch

Appendages (legs, claws, feet, etc.)

Mouth (teeth, beak, tongue, etc.)

Body covering (feathers, fur, scales, etc.)

Coloring (one color, multi-colored, brown, white, blue, etc.)



**Did you know?** The ability of animals to blend into the surrounding environment can come in handy when trying to avoid a predator, especially for animals with little else in their defense. Several animal species, including scorpionfish and leaf frogs, can change their appearance to match their surroundings. Others appear to be something commonly found in their environment, like the walking stick, which looks very much like a twig.

<http://www.animalplanet.com/wild-animals/camouflage/>

# Niches

## Introduction:

An [organism's niche](#) is its requirements in the environment and includes all the **biotic** and **abiotic** factors associated with it. [More information can be found here.](#)

This activity focuses on understanding the concept of niches by examining the organisms in a **temperate deciduous forest biome** and how they impact the environment.

## Objectives:

Students will understand the concept of a niche, which is the specific area that an organism inhabits. Students will infer the impacts of population disturbances on the environment as a whole.

## Materials:

Pen/pencil/markers  
Notebook  
Worksheet

## Key concepts:

Every organism is important for an environment to function properly. The **overpopulation** or **under population** of a species has an impact on the environment.

## Directions:

- Select a trail or trails. Have students observe animals and plants.
- Using the chart on page 34, have students make notes of the organisms' appearances and any notable behaviors.
- Then, record the role or niche they fill in their community. For example, the grass holds down the soil and provides food and shelter for animals. The squirrel spreads seeds. The woodpecker eats insects.
- At the Pavilion, have each student select an organism they observed.
- Then, describe the niche of the organism to the rest of the class and see if the class can identify the organism.
- Once the activity is complete, have students discuss what they believe would happen if a certain organism were to completely disappear *or* if it were to suddenly become overpopulated.
- Prompt students with examples like: if bees disappeared, certain food sources would be depleted quickly because they pollinate a large portion of our crops; or, deer overpopulation causes overgrazing (which is bad for other herbivores) and even health hazards, such as the spread of Lyme disease.



## ECOLOGICAL NICHE

**Ecological Niche:** The specific **role** a species performs in its ecosystem.

- Its role is determined by **how it interacts** with the **biotic** and **abiotic** components of its ecosystem.



*What is the ecological niche of a bee?*

- It **pollinates** different flowers to allow them to produce seeds and offspring.
- They **feed** their own group of predators.









## R.A.F.T Activity

### Introduction:

This activity is useful when studying how different media can portray stories in different ways. It could also be good for talking about author's purpose and how Point of View can affect the way that a story is perceived.

The R.A.F.T writing assignment encourages a new perspective when writing. Students should use the prompt to creatively incorporate information learned from observations recorded at the Lillibridge property. The unique old growth forest and vernal pools create a rich environment and an opportunity for students to observe wildlife protected from human activities. This activity can be done after visiting the property to connect concepts learned while observing the habitats on the site.

### Key Concepts:

How have the organisms in this habitat adapted to the seasons?

How have the organisms' interactions with each other shaped their behavior?

### Objectives:

Students identify the relevance of the species present in a temperate deciduous forest

Students will share and discuss their creative writing pieces

### Directions:

To complete this assignment, have students write a creative piece from one of the prompts (or create your own!). The format is as follows:

**Role of the writer-** Use your unique role as the voice of your writing. Use your knowledge of the subject to explain your point of view.

**Audience-** Keep in mind the audience your writing is directed toward.

You may have a harsh tone for a complaint, but a softer tone for a thank-you note.

**Format-** The format of the writing sets the parameters for your style of writing. A love letter will have a different tone than a news article.

**Topic-** Use the information discussed about the species present in the forest to discuss the topic of your writing. Here are examples, but use what the students saw at Lillibridge.

Role	Audience	Format	Topic
Woodpecker	The forest	Letter	Apology for all the noise I make and why.
Wendy's Tree	Animals	Diary	Amazing things I have seen and why I am so special.
Frog	Tadpole	Letter	My life and your new life in a vernal pool
Spotted Salamander	Weather	Poem	My behavior when the weather warms up
Rotting Log	Amphibians	Advertisement	Space for rent (only dry months!)

### Conclusion:

Students can share their writing in class, at the Pavilion, or display it around the classroom for visual representation of what they saw and learned.

## More R.A.F.T. Prompts

Role	Audience	Format	Topic
Wendy Pfeiffer Lawrence	Students coming to Pfeiffer Nature Center	Poem	What surprises are at the Nature Center.
Biologist	An artist who draws pictures of nature.	Page in a journal	Amazing things that exist only at the nature center.
Person who has been shrunk down to the size of an insect.	Teachers/Friends	A diary	Oh, the things I have seen!
A Chestnut tree	Animals of all sizes	Advertisement	Persuade them to come to the Nature Center.
Baby frog	Hawk	Letter	Why eating me would be bad for your health.
Grasshopper	Humans	Song	What I would do if I was 10ft tall.

This template can be used as a graphic organizer by your students, too.

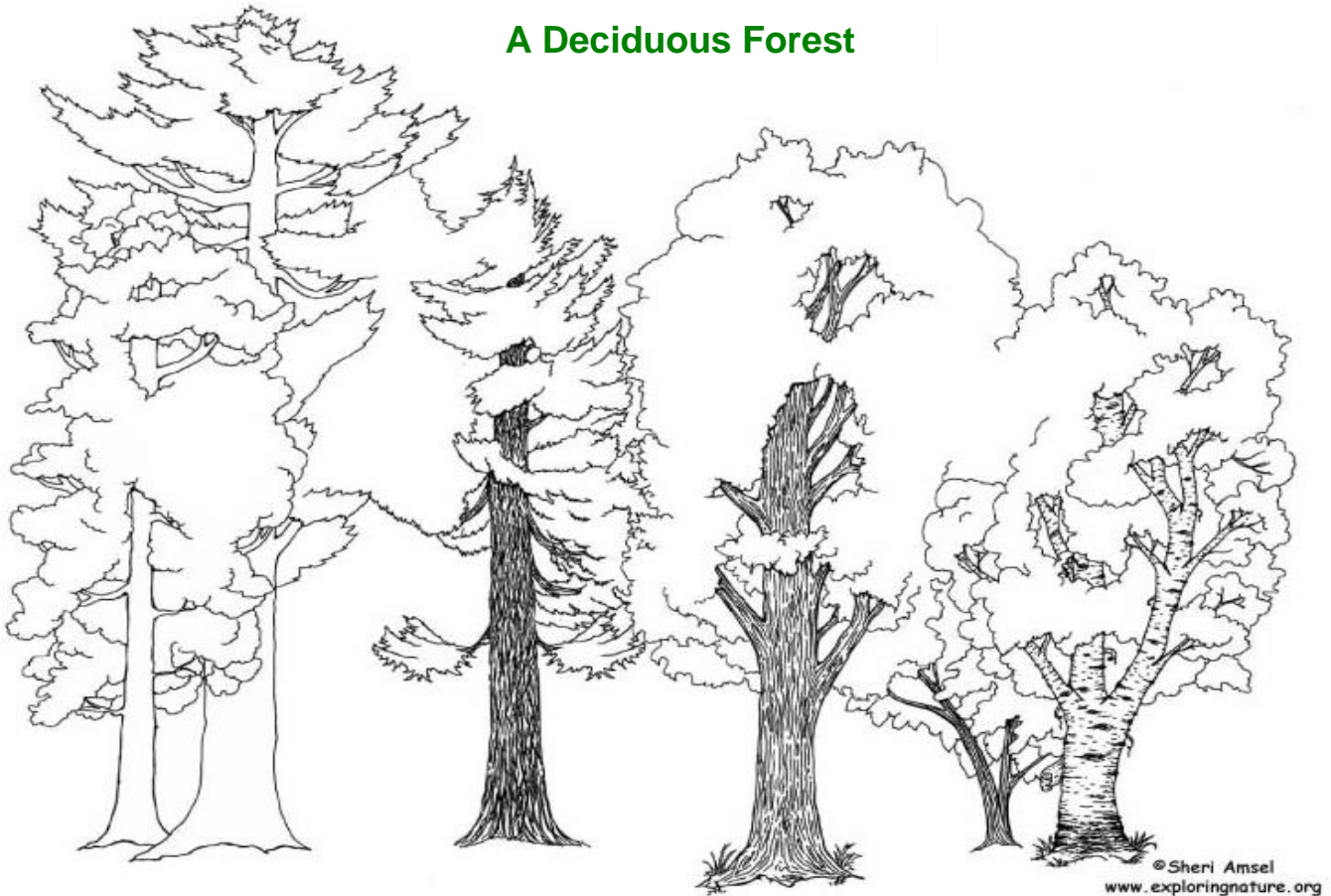


**Did you know?** Grasshoppers descend from ancient ancestors that lived long before the dinosaurs roamed the earth. Primitive grasshoppers first appeared more than 300 million years ago. <https://entomologytoday.org/2015/04/08/the-origin-of-grasshoppers-katydid-and-cricket-a-new-study-resolves-the-evolutionary-tree-of-the-orthoptera/>



## Art Activities with Nature

### A Deciduous Forest



#### Directions:

Have students pick 6 trees they encounter. Then, students create a **Mini-map** of the trees in the area. Gather branches and leaves from the base of the trees. Do not pick fresh leaves or branches off a tree. At the Pavilion, gather the branches and leaves and pass them out to each group. Have the students work cooperatively in groups to identify which trees the branches and leaves came from. Back in class, using the colored illustration, students create posters by illustrating the leaf sample.

#### Summary:

Students identify the deciduous trees and their leaves. Color what the tree would look like in fall. Discuss the shape of each leaf that goes with the trees and if it is compound, simple, opposite or alternate.

In North America there are over 800 different species of trees. Trees are classified according to how they reproduce, what types of flowers and seeds, how they grow, and how they are structured inside. Most trees fall into two main plant groups. Gymnosperms have seeds produced on the surface of the scales of female cones. Conifers are the most common types of gymnosperms. Deciduous trees shed their leaves at the end of the growing period, so they are bare for part of the year. This shedding typically occurs in the months of September and October. They rest during this part of the year. The trees grow new leaves when there is enough sun and rain for them to grow, while most needle-leaved trees are coniferous. Coniferous trees, often called evergreens, keep their leaves for several years and lose them gradually, while growing new ones, so they are never bare. Coniferous trees have leaves that look like needles.

<http://kids.nceas.ucsb.edu/biomes/temperateforest.html>



## Write a poem or song about your experiences at the Nature Center

### Directions:




Visit <https://www.wikihow.com/Write-a-Poem-About-Nature> for steps and ideas.

### Materials:

The students' Nature Journal Notebook, sketch pad, pencil, photos taken at the Nature Center.

### Lesson Applications:

This activity would be useful when studying imagery, figurative language, and poetry.

- [Haiku](#) - consists of three lines. The first line contains five syllables, the second line has seven syllables, and the third has five syllables (five/seven/five),
- [Grow a poem](#) – Here are many examples of poems that express your thoughts of nature.
- [Cinquain](#) – pronounced “sin-cane” was created by American poet Adelaide Crapsey over 100 years ago. These are the rules:
  -  Cinquains are five lines long.
  -  They have 2 syllables in the first line, 4 in the second, 6 in the third, 8 in the fourth line, and just 2 in the last line.
  -  Cinquains do not need to rhyme, but you can include rhymes if you want to. That's it. Just three simple rules. If you want to, you can even memorize the syllable count by remembering this five-digit number: 24682
- [Shape or Concrete poem](#) - Shape is one of the main things that separate prose and poetry. Poetry can take on many formats, but one of the most inventive forms is for the poem to take on the shape of its subject. If the subject of your poem were of a flower, then the poem would be shaped like

A  
TALL  
OAK TREE  
WINDS HOWLS  
ACORNS CLATTER  
D  
O  
W  
N  
TO THE DRY GROUND

***Impressions of a leaf***  
By Tyler Pederson, 2011

A  
leaf  
floats  
freely by  
its thin edges  
collide onto cement  
cell walls shaking briefly  
chloroplast pigments recoil  
dendritic veins drained of color  
sickly stomata, gang green stem  
passing pedestrians, footprints  
flatten and crunch cuticles  
musty, earthworm scent  
rises from the dirt  
decay ensues  
adding  
form  
to  
E  
A  
R  
T  
H

***Autumn Leaves*** by Olivia Wright

Autumn  
Red falling leaves  
Orange, brown and yellow too  
I watch as they float to the ground  
Slowly.

***A beautiful bird***

***Feels free and proud in the sky***

***Flies like an angel.***

***A brave strong seedling***

***Wondering when shall it grow***

***Sitting near the pond.***

## Take a Sound Walk as a Soundscape Scientist!

**Time:** Variable. This is excellent for all ages.

### Objectives:

Students will discover the range of sounds in a natural environment as a "Soundscape."  
Students will categorize the sounds they hear to define and preserve a Soundscape.

### Activity One:

Take a short "soundwalk" through the areas you are visiting. Pay particular attention to what your ears tell you about the outdoors. As you walk, make note of the following:

- What sounds are you hearing? Jot down a list of sounds you hear in your Nature Journal.
- Are the sounds you hear loud or soft? Are they high pitched or low pitched? Are they near or are they far away? Are they sustained (i.e., are they held out for a long time) or are they short?
- As you walk, how do you notice the "soundscape" changing based on your location or features of the landscape (closeness to water, trees, the road, etc.)?

### Activity Two:

As you walk through along the trails, make a list of the sounds you hear and categorize them into three areas...

- Sounds made by **living organisms** (including humans), such as voices, bird calls, and insect noises (biophony)
- Sounds made by **human-made objects**, such as cars, machines, or airplanes (anthrophony)
- Sounds made by **non-living natural objects**, such as wind, running water, or rain (geophony)

### Then, reflect on, think about, and share the following:

- In which category is there the greatest number of different sounds? In which is there the fewest?
- In which category are the sounds the *loudest* or *most noticeable*?
- Soundscape scientists often try to measure "noise pollution." What do you think the term noise pollution means? Do you notice any in the area in which you're listening? Why or why not?
- What could be done to preserve the "Soundscape" at Lillibridge?



Let nature  
be your  
teacher.

William  
Wordsworth



**Did you know?** Natural sounds occupy one-fifth of our human senses and it's easy to miss the subtler tones. The soothing sounds of nature have helped literally hundreds of thousands of people across the world find an inner calmness to help them with study, getting to sleep, relaxing, meditating and fighting off illness, alleviating depression and stress in their lives. <https://www.pbs.org/newshour/science/7-sounds-nature-humans-rarely-hear>



## A Very Special Opportunity - Geocache

### What is Geocaching?

[Geocaching](#) is a real-world, outdoor treasure hunting game using GPS-enabled devices. Participants navigate to a specific set of GPS coordinates and then attempt to find the geocache (container) hidden at that location. You will learn a bit about the geology of our area!

### How is it played?

There are many other levels to the game. At its simplest level, geocaching requires these steps:

1. Register for a free [Basic Membership](#).
2. Visit the "[Hide & Seek a Cache](#)" page.
3. Enter your postal code and click "search."
4. Choose any geocache from the list and click on its name.
5. Enter the coordinates of the geocache into your GPS Device.
6. Use your GPS device to assist you in finding the hidden geocache.
7. Please stay on trails until within **50 feet** of cache as this is a natural site with minimal human disruption desired.
8. You will be looking for a carton with a red lid. Please do not move a cache from its location.
9. Sign the logbook and return the geocache to its original location.
10. Share your geocaching stories and photos online.
11. **Take** knowledge! **Leave** your signature in the logbook.

### These are links to the specific Geocache games:

 N			<a href="#">I Spy</a> by slippery72   GC7VT04   New York		08/08/2018	08/11/2018
 N			<a href="#">A Walk in the...Trees</a> by slippery72   GC7VRZG   New York		08/08/2018	08/11/2018
 N			<a href="#">KC'S Fungus Among Us</a> by slippery72   GC7CMHH   New York		09/22/2017	08/13/2018
 N			<a href="#">Old Grandad</a> by slippery72   GC7C9D7   New York		09/13/2017	07/13/2018
 N			<a href="#">Don't Be Stumped!</a> by slippery72   GC7C87N   New York		09/13/2017	09/06/2018
 N			<a href="#">Pfeiffer Nature Excursion</a> by slippery72 + three   GC9099   New York		09/20/2002	07/13/2018

## Cloze Activity

### Lesson Applications:

This would work well for students who are struggling with sentence structure because it gives them a chance to plug in words that would work the best.

### Objectives:

Students apply what they have learned at the Pfeiffer Nature Center field trip.

### Directions:

Have your students use the words in the Word Bank to fill out the cloze activity and finish the story that is being presented. If you feel like this may be too easy for your students feel free to have them try to fill in the blanks without the Word Bank! Use this as a guide to create your own Cloze activity.

### Word Bank:

Vernal, Lillibridge, Frogs, Pfeiffer, Chestnut Cabin, "Old growth," Logging, Wildlife, Salamanders.

When visiting the \_\_\_\_\_ Nature Center be sure to visit all these important locations on your trip. When you first arrive, you will be right next to the \_\_\_\_\_ that the Pfeiffer family built in the 1940's. The large trees on the property are referred to as \_\_\_\_\_ trees and escaped \_\_\_\_\_ that occurred in the area in the in the early 1900's. Let's not forget about the \_\_\_\_\_ pools either because you might just get lucky and see some \_\_\_\_\_ or \_\_\_\_\_! While on the \_\_\_\_\_ property be sure to hike as many trails as you can because who knows what interesting \_\_\_\_\_ you may see on your journey.



### At the Pavilion:

Select a closing activity to review and share what the students saw, discovered and learned as they prepare to return home.

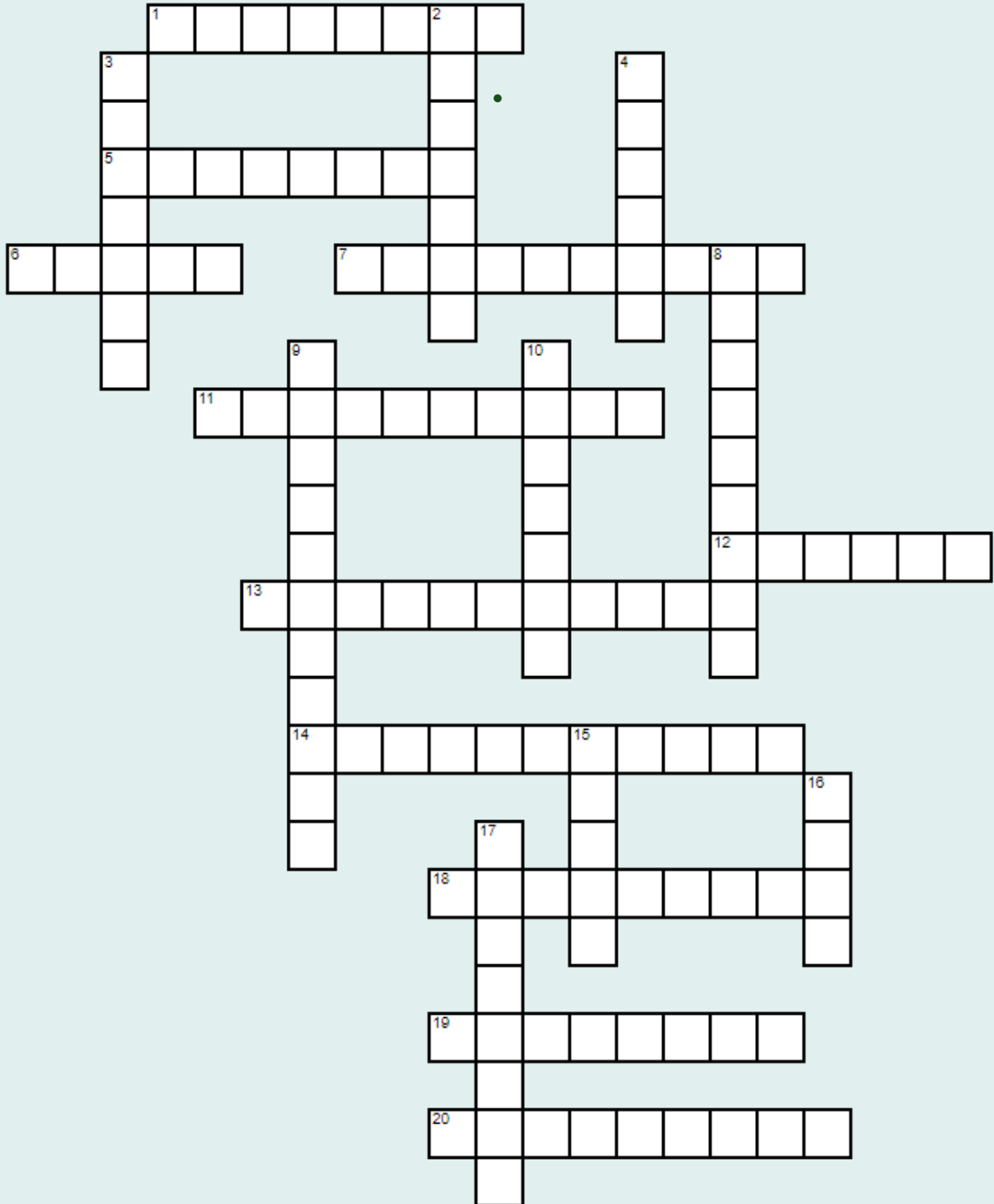
Lead a group discussion centered on students' experiences and questions. Guiding questions may include: What image was the most remarkable? What did you like the best? What new thing did we learn?

Ask students to write a story or poem, make a drawing, compose a song, or do a podcast about their experiences.



**Did you know?** According to the Native Tree Society, the tallest tree in New York State is a 158.3-foot white pine in Adirondack Park. <https://www.nativetreesociety.org/>

## Discoveries at Pfeiffer Nature Center Crossword Puzzle



## Clues

### Across

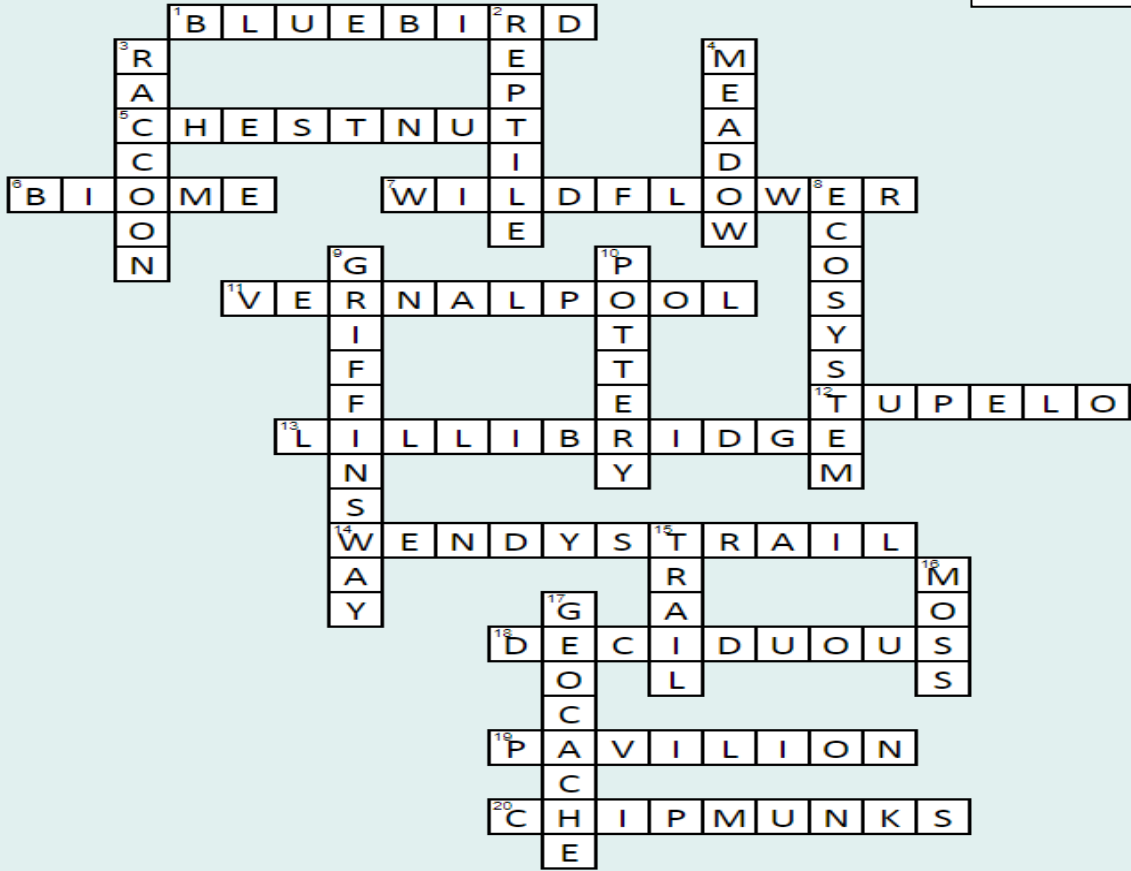
- 1 The NY state bird found at Pfeiffer Nature Center
- 5 A large, deciduous tree of the beech family
- 6 A community of plants and animals that have common characteristics
- 7 A flower that grows in the wild that was not intentionally seeded or planted
- 11 Temporary wetland habitat
- 12 A very special deciduous tree here at the Nature Center with alternate, simple leaves
- 13 Name of one of the properties at the Pfeiffer Nature Center
- 14 Trail named for the person who established the Nature Center to honor her father
- 18 Forests with trees that lose their leaves each year
- 19 Place to gather in the meadow
- 20 Small, striped rodents at the Nature Center

### Down

- 2 A cold-blooded animal with dry, scaly skin
- 3 A mammal with a black mask and ringed tail that lives at the Nature Center
- 4 An area of land that is covered with grass and wildflowers. The Pavilion is here
- 8 All the plants and animals that live in a particular area and inter-relate
- 9 The name of the interpretative trail at the Pfeiffer Nature Center
- 10 Articles made of earthenware or baked clay that Wendy enjoyed creating
- 15 A path through a forest or meadow
- 16 A very, small, soft green plant that grows on damp soil, wood or stone and found throughout the Nature Center
- 17 A real-world, outdoor treasure hunting game you can play at the Nature Center

# Discoveries at Pfeiffer Nature Center

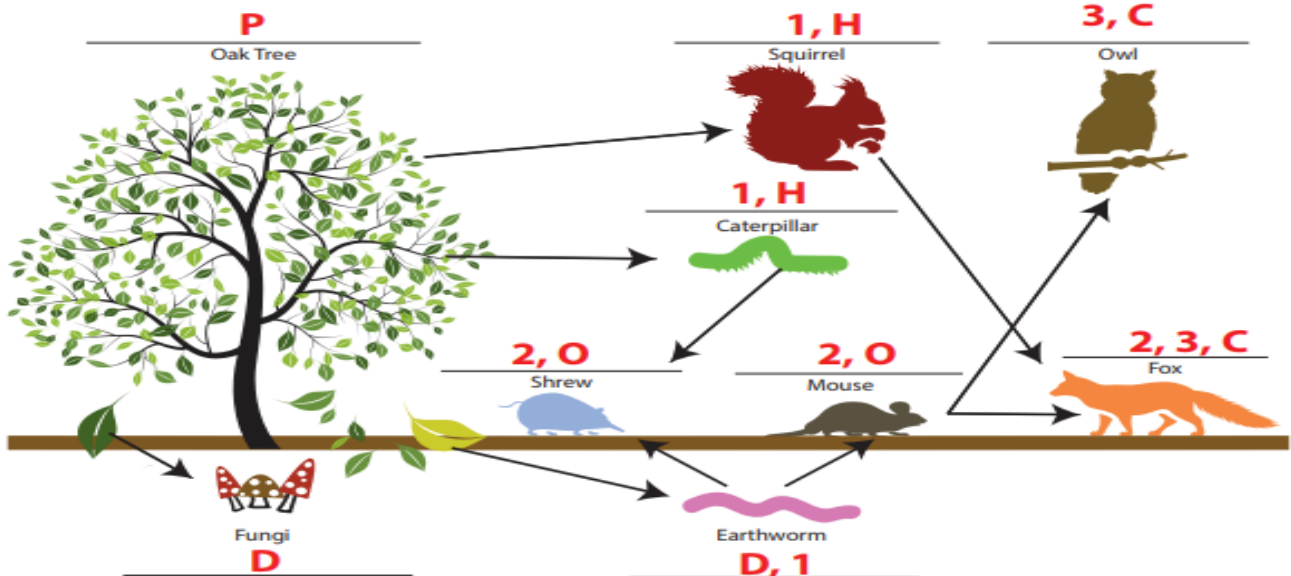
Answer Key



## LABEL THE FOOD WEB

Answer Key

- Label each organism based on its position in the food web:  
**P** = Producer, **1** = Primary Consumer, **2** = Secondary Consumer, **3** = Tertiary Consumer, **D** = Decomposer (Some may have more than one label.)
- Then label each animal as: **H** = Herbivore, **C** = Carnivore or **O** = Omnivore



## Species List Appendix

### Common Mammals

Eastern chipmunk: *Tamias srius*  
 Eastern Gray Squirrel: *Sciurus carolinensis*  
 Flying Squirrel: *Glaucomys Volans*  
 Red Squirrel: *Tamiasciurus hudsonicus*  
 Opossum: *Didelphis marsupialis*  
 Porcupine: *Erethizo dorsatum*  
 Eastern Cottontail: *Sylvilagus floridanus*  
 Woodchuck: *Marmota monax*  
 House Mouse: *Mus musculus*  
 Deer Mouse: *Peromyscus maniculatus*  
 Whitetail Deer: *Odocoileus virginianus*  
 Raccoon: *Procyon lotor*  
 Longtail Weasel: *Mustela frenata*  
 Red Fox: *Vulpes fulva*  
 Gray Fox: *Urocyon cinereoargenteus*  
 Coyote: *Canis latrans*  
 Black Bear: *Ursus americanus*

### Common Amphibians

American Toad: *B. americanus*  
 Spring Peeper: *P. crucifer*  
 Wood Frog: *R. sylvatica*  
 Green Frog: *R. clamitans melanota*  
 Gray Tree Frog: *H. versicolor*  
 Red-spotted Newt: *N. viridescens*  
 Jefferson Salamander: *A. jeffersonianum*  
 Northern Dusky Salamander: *D. fuscus*  
 Mountain Dusky Salamander: *D. ochrophaeus*  
 Wehrle's Salamander: *P. wehrlei*  
 Northern Slimy Salamander: *P. glutinosus*  
 Redback Salamander: *P. cinereus*  
 Northern two-lined Salamander: *E. bislineata*  
 Northern Red Salamander: *P. ruber*  
 Four-toes Salamander: *H. scutatum*

### Common Trees

#### Conifers

White Pine: *Pinus strobus*  
 Red Pine: *Pinus resinosa*  
 Eastern Hemlock: *Tsuga canadensis*

#### Common Ferns

Marginal Wood Fern: *Dryopteris marginalis*  
 Spinulose ood Fern: *Dryopteris spinulosa*  
 EvergreenWood Fern: *Dryopteris intermedia*  
 New York Fern: *Thelypteris noveboracensis*  
 Hayscented Fern: *Dennstaedtia punctilobula*  
 Ostrich Fern: *Matteuccia struthiopteris*  
 Sensitive Fern: *Onoclea sensibilis*  
 Christmas Fern: *Polystichum acrostichoides*  
 Bracken: *teridium aquilinum*  
 Madenhir Fern: *Diantum pedatum*  
 Interruted Fern: *Osmunda claytoniana*  
 Cinnamon Fern: *Osmunda cinnamomea*

#### Deciduous

White Ash: *Fraxinus quadrangulate*  
 Striped Maple: *Acer pensylvanicum*  
 Red Maple: *Acer rubrum*  
 Silver Maple: *Acer saccharinum*  
 Sugar Maple: *Acer saccharu*  
 Black Locust: *Robinia pseudoacacia*  
 Tuliptree: *Liriodendron tulipifera*  
 Quaking Aspen: *Populus tremuloides*  
 Bigtooth Aspen: *Populus grandidentata*  
 Northern Red Oak: *Quercus rubra*  
 White Oak: *Quercus alba*  
 Chestnut Oad: *Quercus prinus*  
 Chestnut: *Castanea dentata*  
 Beech: *Fagus grandifolia*  
 Common Witch-hazel: *H. virginiana*  
 Yellow Birch: *Betula alleghaniensis*  
 Black Cherry: *Prunus serotine*  
 Cucumber Magnolia: *Magnolia grandiflora*

### Other Common Plants

Cleavers  
 Golden rod  
 Poison ivy  
 Jewelweed  
 Blue flag  
 Multiflora rose  
 Wild strawberry  
 Brambles

Hawthorne  
 Partridge berry  
 Wintergreen  
 Star flower  
 Canada mayflower  
 Wild geranium  
 Swamp buttercup  
 Mayapple

Solomon seal  
 True forget-me-not  
 Yellow sorrel  
 Milkweed  
 Curly dock  
 Common plantain  
 Marsh Marigold  
 Lowbush Blueberry

## PA and New York Standards

### Page 11: Nature Journaling

PA Standard CC.1.4.9-10.D: Organize ideas, concepts, and information to make important connections and distinctions; use appropriate and varied transitions to link the major sections of the text; include formatting when useful to aiding comprehension; provide a concluding statement or section.

New York Standard: WHST3: Write narratives to understand an event or topic, appropriate to discipline specific norms, conventions, and tasks.

New York Standard: WHST 5: Conduct short as well as more sustained research projects to answer a question (including a self-generated question), analyze a topic, or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

### Page 15: Historical Role Play Activity

PA Standard 8.2.U.A. Evaluate the role groups and individuals from Pennsylvania played in the social, political, cultural, and economic development of the U.S.

### Page 18: Think like a Scientist

New York Standard PERFORMANCE INDICATOR 3.1 Use various methods of representing and organizing observations (e.g., diagrams, tables, charts, graphs, equations, matrices) and insightfully interpret the organized data.

PA Standard 4.1.10 Know that both direct and indirect observations are used by scientists to study the natural world and universe. Identify questions and concepts that guide scientific investigations.

### Page 20: Discover Vernal Pools at Lillibridge

BIO.B.4.2.1 Describe how energy flows through an ecosystem

New York Standard 5. Organisms maintain a dynamic equilibrium that sustains life.

### Page 21 – 36: Energy Flow through the Ecosystem at Lillibridge

PA Standard 4.5.4.D. Explain how specific adaptations can help organisms survive in their environment.

PA Standard 4.1.5.A. Describe the roles of producers, consumers, and decomposers within a local ecosystem.

PA Standard 4.1.7.A. Describe the relationships between biotic and abiotic components of an ecosystem.

Compare and contrast different biomes and their characteristics. Describe symbiotic and predator/ prey relationships.

PA Standard 4.1.10.C Evaluate the efficiency of energy flow within a food web.

BIO.B.4.2.2 Describe biotic interactions in an ecosystem (e.g., competition, predation, symbiosis).

New York Standard: 1.1b An ecosystem is shaped by the nonliving environment as well as its interacting species. The world contains a wide diversity of physical conditions, which creates a variety of environments

New York Standard Key Idea 6: Plants and animals depend on each other and their physical environment.

6.1a Energy flows through ecosystems in one direction, typically from the Sun, through photosynthetic organisms including green plants and algae, to herbivores to carnivores and decomposers.

6.1g Relationships between organisms may be negative, neutral, or positive. Some organisms may interact with one another in several ways.

Next Generation Science Standard MS-LS2-1.

Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

1. LS2.A: Interdependent Relationships in Ecosystems.

Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.

Growth of organisms and population increases are limited by access to resources.

Next Generation Science Standard MS-LS2-3.

Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

### Page 37: English Language Arts Activities with Nature

PA CC.1.4.9-10.M: Write narratives to develop real or imagined experiences or events.

PA Standard CC.1.4.9-10.F: Demonstrate grade-appropriate command of the conventions of Standard English grammar, usage, capitalization, punctuation, and spelling.

PA Standard CC.1.2.9-10.D: Determine an author's point of view and analyze how rhetoric advances the POV.

New York Standard: 9-10W3: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

New York Standard: 9-10W4: Create a poem, story, play, artwork, or other response to a text, author, theme or personal experience; demonstrate knowledge and understanding of a variety of techniques and genres. Explain divergences from the original when appropriate.

### Page 37: Storytelling

PA Standard CC.1.3.9-10.D: Determine the point of view of the text and analyze the impact the point of view has on the meaning of the text.

PA Standard CC.1.2.9-10.G: Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia).

New York Standard: 9-10, 11-12W3: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

### Page 38-39: RAFT Activity

PA Standard CC.1.4.9-10.M: Write narratives to develop real or imagined experiences or events.

New York Standard: 9-10W4: Create a poem, story, play, artwork, or other response to a text, author, theme or personal experience; demonstrate knowledge and understanding of techniques and genres. Explain divergences from the original when appropriate.

New York Standard: 11-12W3: Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.

### Page 40: Write a poem or song about your experiences at the Nature Center

PA Standard CC.1.4.9-10.O: Use narrative techniques such as dialogue, description, reflection, multiple plot lines, and pacing, to develop experiences, events, and/or characters; use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, settings, and/or characters.

New York Standard: 9-10W3: Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

New York Standard: 11-12W3: Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.

### Page 42: Cloze Activity

PA Standard CC.1.2.9-10.K Determine or clarify the meaning of unknown and multiple meaning words and phrases based on grade level reading and content, choosing flexibly from a range of strategies and tools

New York Standard: 9-10W2c: Use precise language and content-specific vocabulary to express the appropriate complexity of a topic

### Page 43: Listening Game

PA Standard CC.1.4.9-10.O: Use narrative techniques such as dialogue, description, reflection, multiple plot lines, and pacing, to develop experiences, events, and/or characters; use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, settings, and/or characters.

New York Standard: 9-10SL1: Initiate and participate effectively in collaborative discussions with diverse partners on topics, texts, and issues; express ideas clearly and persuasively, and build on others.

### Page 41: "A Day in the Life"

PA Standard CC.1.3.9-10.D: Determine the point of view of the text and analyze the impact the point of view has on the meaning of the text.

New York Standard: 11-12W3: Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.



## Citations of Activities

- Anticipation Guide**, pg 10 ..... Created by Pitt Bradford students
- Nature Journaling Suggested Activities**, pg 12 ..... “Keeping a Nature Journal”  
2<sup>nd</sup> Edition by Clare Walker Leslie and Charles E. Roth, 2000.
- Build a Bluebird Box**, pg 16 ..... Free Bluebird House Plans for Eastern,  
Western & Mountain Bluebirds, <http://www.birdwatching-bliss.com/bluebird-house-plans.html>
- Label the Food Web**, pg 17 ..... Food Chain Worksheets for High School  
By Tara Kunesh, M.Ed. <https://home-school.lovetoknow.com/worksheets-printables/food-chain-worksheets-high-school>
- What is Biodiversity?** pg. 18 ..... Lesson developed by Mélissa Garrigue and Réjane Limet  
<http://www.inquirebotany.org/uploads/files/The%20INQUIRE%20lesson%20plans.pdf>
- The 6 Kingdoms of Life is Biodiversity**, pg. 19 ..... by Regina Bailey  
<https://www.thoughtco.com/six-kingdoms-of-life-373414>
- Plant Kingdom**, pg 20 ..... Created by Pitt Bradford students
- Classification of Plants**, pg 21 ..... Exploring Nature Science Education Resource:  
Life Science, Earth Science, and Physical Science Resources for K-12  
<https://www.exploringnature.org/db/view/Gallery-of-Full-sized-Full-Color-Art-for-Licensingbr-TREES-PLANTS-WILDFLOWERS>
- Characteristics of Plants** ..... by Sheri Amsel
- Activity** ..... Created by Pitt Bradford students
- Characteristics of Plants & Animals**, pg 22 ..... by Maria Cook; Updated April 11, 2018  
<https://sciencing.com/characteristics-plants-animals-5491852.html>
- Forest Food Web**, pg 23 .... by Sheri Amsel, <https://www.thinglink.com/scene/709109737580396546>
- Activity** ..... Created by Pitt Bradford students
- Vernal Pool Food Web**, pf 23 ..... by Doug Wechsler  
<https://dougw.photoshelter.com/image/I0000zXESNww0sXc>
- Ecosystem Table**, pg 26 ..... [Ecology by Inquiry](http://ioer.ilsharedlearning.org/ContentDocs/c9090ebe-86ef-44fc-b0bb-a791b70285ea/4644/Bio_-_Unit_6_-_Ecology_by_inquiry.pdf) by Kathryn Kelsey and Ashley Steel  
[http://ioer.ilsharedlearning.org/ContentDocs/c9090ebe-86ef-44fc-b0bb-a791b70285ea/4644/Bio - Unit 6 - Ecology by inquiry.pdf](http://ioer.ilsharedlearning.org/ContentDocs/c9090ebe-86ef-44fc-b0bb-a791b70285ea/4644/Bio_-_Unit_6_-_Ecology_by_inquiry.pdf)
- Do Plants Breathe?** pg 27 ..... <https://www.cabarrus.k12.nc.us/site/handlers/filedownload.ashx?moduleinstanceid=97774&dataid=259581&FileName=Activity%20%20Do%20Plants%20Breathe.pdf>
- Discover the Trees at Lillibridge, Create a Bark/Tree Journal**, pg 28 .....  
Adapted by Pitt Bradford students from [https://rangerrick.org/crafts\\_activities/make-a-tree-journal/](https://rangerrick.org/crafts_activities/make-a-tree-journal/)

**Niche Activities**, pg 32-34 <https://www.biointeractive.org/classroom-resources/niche-partitioning-activity>

**R.A.F.T Activities**, pg 35,36 .....Created by Pitt Bradford students

**Art Activities with Nature**, pg 37 .....by Sheri Amsel [www.exploringnature.org](http://www.exploringnature.org)

**Write a poem or song about your experiences**, pg 39 .....  
<https://www.wikihow.com/Write-a-Poem-About-Nature>

**Take a Sound Walk**, pg 40 .....Adapted by Pitt Bradford students from *Your Ecosystem Listening Labs (YELLS)*, *The Science of Soundscape Ecology Instructor's Guide, Grades 5-8*,  
[https://www.purdue.edu/fnr/ilisten/educators/wp-content/uploads/2017/08/YELLS\\_instructor\\_guide\\_8th\\_edition.pdf](https://www.purdue.edu/fnr/ilisten/educators/wp-content/uploads/2017/08/YELLS_instructor_guide_8th_edition.pdf)

**Cloze Activity**, pg 42 ..... Created by Pitt Bradford students

**Crossword Puzzle**, pg 43 .....Created by Pitt Bradford students



# THE RESOURCE GUIDE TEACHER EVALUATION FORM

Please go to our website <http://pfeiffernaturecenter.org> to send it back directly online!  
Or you can mail it to us at PO Box 802, Portville, NY 14770.

Your feedback is vital to creating programs that meet your needs and the interests of students.  
Thank you.

YOUR NAME \_\_\_\_\_

NAME OF SCHOOL \_\_\_\_\_

EMAIL ADDRESS \_\_\_\_\_

Which part(s) of the experience at Pfeiffer Nature Center did you find most helpful for you and your students?

Was the guide useful to you?

Which part(s) did you find most ..helpful?

How can we improve the field trip experiences for the future?

# THE RESOURCE GUIDE STUDENT EVALUATION FORM

Please have your teacher send it back directly online.  
Or mail it to us at PO Box 802, Portville, NY 14770.

Your feedback is important for us to create programs that meet your interests. Thank you.

YOUR NAME \_\_\_\_\_

NAME OF SCHOOL \_\_\_\_\_

GRADE \_\_\_\_\_

What I enjoyed doing most today was:

Something new I learned today is:

As a result of my experiences at Pfeiffer Nature Center, I feel inspired to find out more about the natural world. Please circle the number that best shows your feelings.

(Please circle) Not at all 1 2 3 4 5 A lot

Has your visit to Pfeiffer Nature Center today changed the way you feel about science?

(Please circle) Not at all 1 2 3 4 5 A lot

If your feelings about nature have changed, in what way have they changed?

How do you think this field trip could be improved?