



The Compass to Nature

Teaching in the Outdoor Classroom



PRAIRIE WETLANDS LEARNING CENTER, FERGUS FALLS, MN

ACKNOWLEDGEMENTS

This publication was developed and written by Prairie Wetlands Learning Center staff, U.S. Fish and Wildlife Service. Thanks to David Ellis and Molly Stoddard for their contributions of content and editing and to Sue McDonald for her vision and guidance. Special thanks to 4th grade Prairie Science Class teacher, Monique Davis, for reviewing it. Special thanks also to Kia Donais, Friends of the Prairie Wetlands Learning Center board member, for donating her excellent skills in publication design. Photo credits: U.S. Fish and Wildlife Service unless otherwise noted.

PRAIRIE SCIENCE CLASS

The Prairie Science Class is an internationally-recognized partnership between the U.S. Fish and Wildlife Service's Prairie Wetlands Learning Center and the Fergus Falls Independent School District 544. Its mission is to use the local prairie wetlands ecosystem daily as an integrating and motivating context to engage 4th and 5th grade students in science, applied math, language arts, art, social studies, and health and through real world, field-based learning experiences. For more information, please search the Internet, email prairiewet@fws.gov, call (218) 998-4480 or write to PSC, 602 State Highway 210 E, Fergus Falls MN 56537.

FRIENDS OF THE PRAIRIE WETLANDS LEARNING CENTER

The Friends of the Prairie Wetlands Learning Center is a non-profit organization that enhances and promotes the understanding and conservation of the prairie pothole region, primarily through support of the PWLC. They volunteer, educate, support, advocate, fund raise, obtain grants; as well as operate the Bluestem Store. For more information and your free membership, please search the Internet, email fpwlc@prtcl.com, call 218-998-4488 or write to Friends of the PWLC, PO Box 229, Fergus Falls, MN 56538.

THE PRAIRIE WETLANDS LEARNING CENTER (PWLC)

The PWLC is located on the edge of the city of Fergus Falls, in Otter Tail County, in western Minnesota, on the eastern edge of the prairie pothole region of North America. Comprised of more than 330 acres of restored and original wetlands and prairies, the PWLC includes a visitor center, dormitory, amphitheater, hiking trails, bridges, dock, and more. It is home to the Prairie Science Class partnership and is located on the Townsend Waterfowl Area in the Fergus Falls Wetland Management District. For more information, search the Internet, find the PWLC on Facebook, email prairiewet@fws.gov, call (218) 998-4480 or write to PWLC, 602 State Highway 210E, Fergus Falls, MN 56537.



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The PWLC is part of the Fergus Falls Wetland Management District, managed by the U.S. Fish and Wildlife Service. The Service manages the 941.6 million acre National Wildlife Refuge System, which encompasses more than 565 National Wildlife Refuges, Wetland Management Districts, and other special management areas. The Service is the principal Federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. For more information, visit www.fws.gov or call 1-800-344-WILD or write to U.S. Fish and Wildlife Service, 1849 C Street, NW, Washington, DC 20240.

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Introduction

The Compass to Nature

When humans have a relationship with the outside world, they care about it. David Sobel, author of Beyond Ecophobia, clearly reminds us that this must be first priority in connecting people with nature. The Compass to Nature is a group of four components for building relationships with nature. It works for children; it works for adults.

As a navigational compass enables us to guide our way outside, the four points of the Compass to Nature provide unfailing direction for all who seek to lead others in the development of a connected, caring relationship with the world we live in. Unifying the four components is the sense of wonder promoted by Rachel Carson in her book entitled, The Sense of Wonder. The sense of wonder, or awe, is the primary means by which the human heart is connected to nature. It is the glue which holds the other four Compass components together. Leave out wonder, and relationship building with nature is ineffective.

Take a brief journey into the Compass to Nature. First, we unpack each component individually for examination. As you study them, reflect on their simplicity. Consider the practicality of each. The sole purpose of the Compass is to provide parents, teachers and other educators a way to lead the hearts and minds of children and adults back into nature. The Compass to Nature is free for anyone to use.



If we want children to flourish, to become truly empowered, let us allow them to love the earth before we ask them to save it.

~ David Sobel

The Compass to Nature

Teaching in the Outdoor Classroom



1 Place

Connection of students to their local environment through hands-on, real-world learning experiences.



3 Naturalists

Using work from relevant and meaningful naturalists to learn how to best study nature.



4 Journals

The regular recording of observations, perceptions, and feelings about the natural world around you.



A Sense of Wonder

Arousing an emotional connection and fascination with nature.

2 Phenology

The practice of using nature's calendar to determine what to study, when.





Place



When asked where they live, most people typically respond with their address or the name of the city, state, province, or reservation they reside in. What if you were asked, “Where do you live in nature?” What would you reply then? Perhaps you live in the desert, the mountains, forest, prairie, or tundra. Maybe you live near a wetland, stream, river, lake, or ocean. The place where you live in nature is what we mean by “place.”

Have you read the owner’s manual for your place? The best way to know how the earth works: go outside. “Get to know one thing really well,” in the words of Byrd Baylor’s children’s book, The Other Way to Listen. Get to know one place, your place, really well. It’s a form of literacy not unlike reading written language. We need to create ecologically literate students as well, the next generation of humans who will steward our home planet.

In the last 100 years or more, for better and for worse, many humans have become indoor people for the first time in the history of *Homo sapiens*. In his groundbreaking international bestseller Last Child in the Woods, Richard Louv spotlights the alienation of children from the natural world, coining the term *nature-deficit disorder* and outlining the benefits of

a strong nature connection—from boosting mental acuity and creativity to reducing obesity and depression, from promoting health and wellness to simply having fun.

Children do not need to be frightened into ecophobia by large environmental problems they are not equipped emotionally, intellectually, physically, socially, or otherwise to solve. Nor do we need to advocate for a particular type of resolution to those problems. We merely need to give children the chance to build a relationship with their place and discover for themselves how nature works (with guidance from the responsible adults in their lives).

Place-based learning is best described as experiential learning with four main components:

- **ACTIVE STUDENT INVOLVEMENT**
- **REFLECTION ON EXPERIENCES**
- **DEVELOPING NEW KNOWLEDGE OF THE WORLD**
- **APPLYING THE KNOWLEDGE TO NEW SITUATIONS**



Place Approaches For Educators

The Compass to Nature adopts the basic principles of place-based education: examine your own back yard, school yard, natural area, and provide relevance to the learner. Place-based education is interdisciplinary and develops a love of place and nature. When we acquire knowledge about our place, we learn about our neighbors. It is discovering those with fur, feathers, exoskeletons, and those with chlorophyll. Understanding cycles and food webs is essential in knowing your place. Knowing place leads to discoveries of beauty and wonder. A place-based nature investigator finds health and release from stress. Knowing your place is a lifetime occupation; at first it may be a duty, then later in life, a need to know. Knowing place is education-based, environmentally supportive, and sheer joy. It is a valuable enterprise for all citizens of earth.

A study of place involves academic rigor at every grade level and subject, nourishing the mind and heart. According to David Sobel in his book, Place-Based Education, "Place-based education is the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects across the curriculum..."

"If we are going to get back [to nature], we need to look first at where we are now.' Katie Avery, third-grade teacher in the White Mountain-encircled town of Gorham, New Hampshire, got at the crux of the place-based discussion during a curriculum planning meeting when she asked, 'Why are we using textbooks that focus on landforms in Arizona when we have such amazing resources right in our backyard.'"

Why Place?

"Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates heightened commitment to serving as active, contributing citizens." (Sobel)

Of course we often overlook local resources in favor of traveling to distant and seemingly more glamorous locations. When children are given the opportunity to know their own place intimately, however, they acquire an expert base from which to make comparisons and contrasts with unfamiliar and different biomes they visit and places they steward throughout life.

In the Compass to Nature, then, place-based learning answers the question WHERE will I teach? The best place is the one closest to your door because it is the one that is easiest and quickest to access, the one you are most likely to use on a repeat basis – daily, weekly, monthly, or seasonally. The more often you use it, the more deeply you will understand your place and the richer your relationship with it. Of course, it is not the only place you teach, but it can become the primary and even the most meaningful place you teach. Your site may be your school yard, back yard, garden, vacant lot, city park, cemetery, boat landing ... The nature of that site becomes center stage, the main event, while your textbook becomes a resource to use as needed.





Knowing Your Place

• Nourishes and refreshes heart and mind.

• Strengthens the body, releases stress, and enhances health.

• Delights diligent explorers and creates joy.

• Helps us get to know our nature neighbors better.

• Leads to discovering beauty and wonder.

• Can become a lifetime endeavor.



Place-based education works because:

- It provides educators with in-context and concrete experiences that connect to grade-level curriculum and increase in learning and retention.
- It creates a school-year-long enthusiasm and motivation for learning, as all children have an innate interest in nature.
- It provides both educator and children with opportunities to go outside. Even for short periods of time, such activity will improve time on-task and quality of work when students are working inside. Time outside always provides experiences that can be integrated with curriculum.

In the Compass to Nature, place-based learning focuses on the nature outside the door where you live, learn, and occupy life. As tenants of this earth sphere which sustains our physical, social, emotional, spiritual needs for every moment of life, should we not know how the earth works, in detail? Knowing the earth, every facet, aspect, and feature – that is place-based learning in the Compass to Nature.

“Cold makes me think how lucky I am. It’s such a great feeling - I can’t explain it. I come here, go outside, and I feel a lot better. I love this place.” - 5th Grader

REFLECT ON YOUR PRACTICE:

Where is the nature place nearest your classroom, natural area or home to begin learning about nature with those you have influence with? The tools you might use to introduce them to this place: Phenology, Naturalists, Nature Journal.



Phenology

Phenology is nature's calendar of events. The events change with the seasons depending upon the climate where you live. In Minnesota, we experience four distinct seasons with varying air temperatures, prevailing wind patterns, and precipitation.



Our animals and plants alter their behaviors, appearances, and life cycle stages in response for their own survival. For example, sometimes we casually notice our first earthworm when the ground thaws out, the arrival of our first robin, or when the first dandelion or pussy willow blooms. A human parent thrilling over a first tooth, first spoken word, and first step is also a phenologist! There is a predictable, seasonal progression of natural events from year to year. Our observation, recording, and study of these changes is phenology. Phenology is not limited to "firsts" though. In its fullest picture, phenology includes firsts, lasts, and every life stage in between.

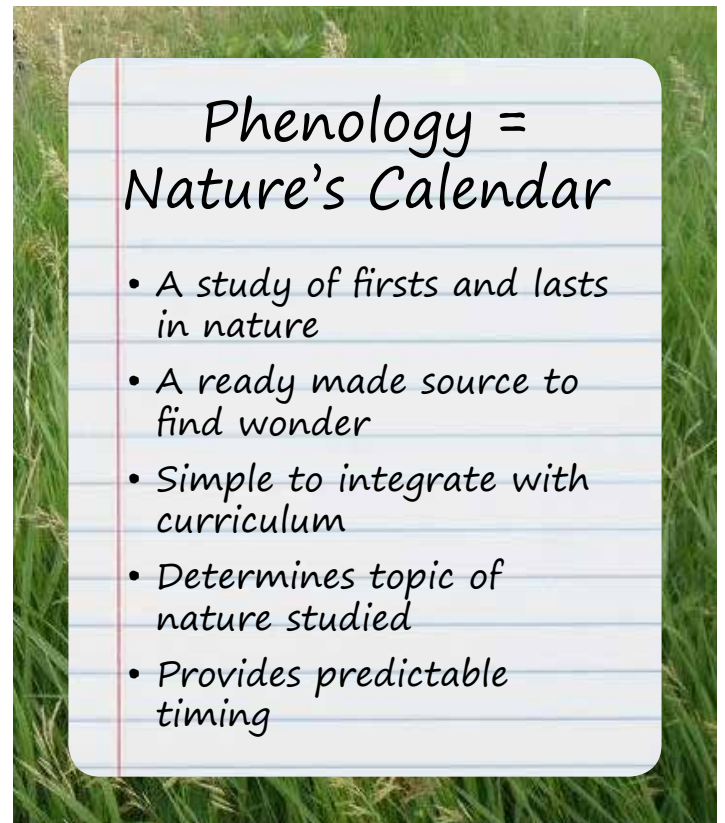
Author and conservationist Aldo Leopold described it this way, "Many of the events of the annual cycle recur year after year in a regular order. A year-to-year record of this order is a record of the rates at which solar energy flows to and through living things. They are the arteries of the land. By tracing their response to the sun, phenology may eventually shed some light on that ultimate enigma, the land's inner workings."

We tend to take a rather broad view of phenology in the Compass to Nature to include weather and environmental conditions as well as plants and animals. Phenology may include: the timing of the sun's position relative to the earth's surface, air/soil/water/snow temperatures, wind speed/direction, precipitation, day/night length, moon phases, ice out, freeze-up, migration, feeding, resting, preening, mating, birthing, egg-laying, hatching, maturing, shedding, molting, sprouting, bud burst, flowering, pollinating, seeding, dormancy, hibernating, resisting, surviving, aging, dying, decomposing, nutrient cycling, photosynthesis, and more. Combined, place and phenology present an infinite number of topics for investigation in the outdoor classroom.

Approaches For Educators

In the Compass to Nature, Place answers the question -- WHERE will I teach? **Phenology answers the questions WHAT will I teach, and WHEN will I teach it?** Phenology must be considered in planning. It helps determine what and when you study. An examination of monarchs could be done any time of year indoors, but should be done when monarchs are naturally present outdoors, allowing authentic, real-time observation and study, perhaps providing the opportunity to witness the amazements of metamorphosis or migration in-person, first-hand. Use phenology as a guide in your study of your place. Let it be an entry way to unexplored wonders of the natural world.

Phenology of your place around a school building will produce surprising benefits with little extra work. A school year long phenology investigation can be integrated with language arts, science, math, history, art, even health, making it a significant instructional tool which yields real data collected by students. Over time, long-term trends emerge and broader analysis becomes possible.





Phenology

Observing the occurrence of natural events logically leads to the investigation of related happenings that were before perhaps overlooked or never considered. Phenology creates a need for record keeping, which promotes the use of a journal or science notebook, another component of the Compass to Nature.

One way to incorporate phenology is through citizen science projects. Many conservation and biological organizations offer opportunities for the amateur naturalist – including educators and students -- to support regional, national, or international research efforts of professional scientists. A wealth of information about citizen science projects is available on the Internet including cloud cover, monarchs, birds, reptiles, amphibians, bud burst, wild flowers – truly any plant and animal species. Participants can also

report collected data and observations on-line which are then compiled with submissions from other citizen scientists for analysis, drawing from them conclusions and recommendations. As Rachel Carson wrote in The Sense of Wonder, “The lasting pleasures of contact with the natural world are not reserved for scientists but are available to anyone who will place himself under the influence of earth, sea, and sky and their amazing life.”

To explore phenology, use your outdoor site as often as possible, at least in every season, or monthly, or weekly, at most daily. Record your observations and selected “firsts” and “lasts” in nature. Start simply. Be lenient, patient, and persistent; it takes time and discipline to develop and continue a practice of observing, recording, and interpreting natural events.



Enjoy nature in all kinds of weather. Record things like egg hatching and chick growth or the first flower of spring. Tap into national database information like Monarch Watch.

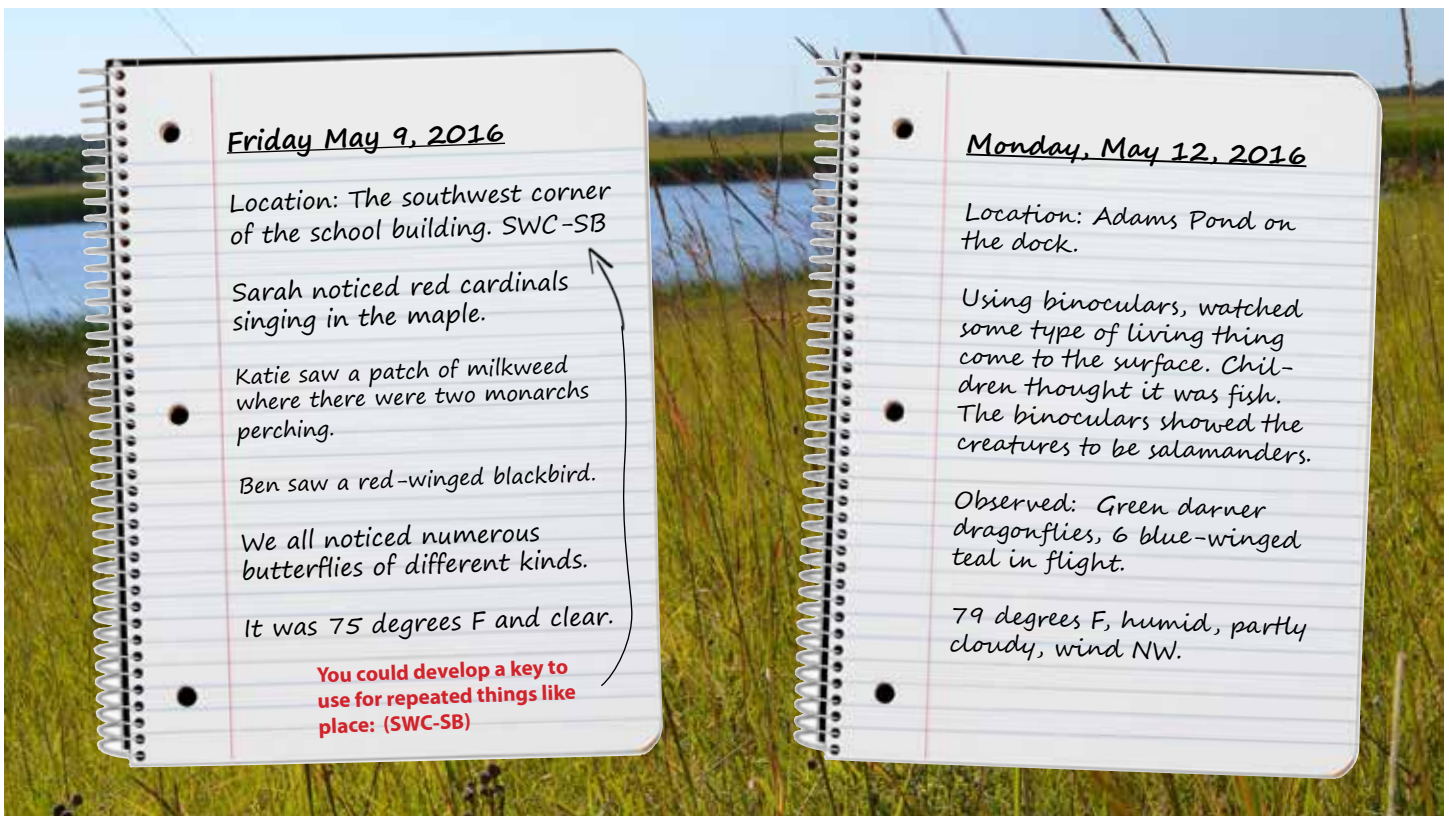


Phenology

How do I start? Develop awareness of what is happening in nature at the time you are outside. Search for things happening the first – or last – time during each season. Try these steps as you begin:

What could I teach today based on the phenology of my place?

- Go outside at the same time to the same place daily or on a regular basis.
- Take a science notebook or field journal with you.
- For each observation, record the day and date at the top of the page.
- A formal way to incorporate phenology into a classroom routine is through the development of a weekly phenology observation by the class.



IDEAS USING PHENOLOGY:

- Create a class chart/list of firsts.
- Measure something at the place you observe – this may be as simple as a leaf or plant stem.
- Record the data on a visual display or chart so you can watch changes together.
- Use collected data to develop graphs, discuss observable facts, and draw conclusions.
- Look for patterns, make predictions, and compare data.
- Use phenology records to help understand the place you are using as a classroom.
- Phenology records create real data to be interpreted, documented, and written about.



Phenology

Phenology is a valid, engaging way to begin to discover a way in to nature. It can initiate your Compass to Nature journey and be your guide as you continue a journey that can last for years or even a lifetime. It could become a fulfilling lifelong hobby for you and those you share it with.



Phenology works because it:

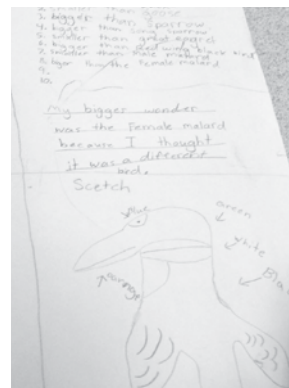
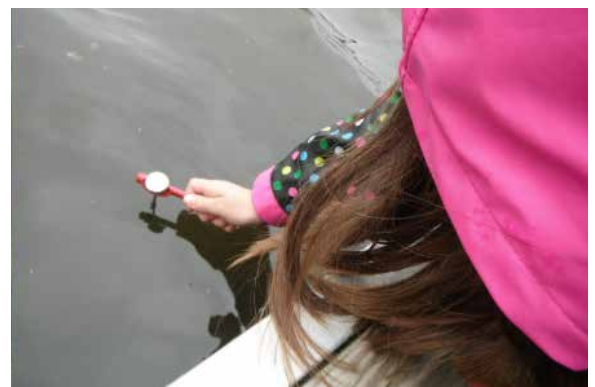
- Guides the education practitioner and students or visitors in studying local nature.
- Builds connections with your site and home environment.
- Teaches educators and children to wonder. Seasonal change is filled with awe.
- Provides genuine reasons to go outside regularly – nature changes every day!
- Is hands-on and provides seasonally appropriate topics and content.
- Delivers cross-curricular connections that support integration with grade-level subject matter.
- Promotes in-depth development of observation, critical thinking, and problem-solving skills.
- Supports science and wildlife management and conservation goals when intentionally coordinated together.
- Encourages better understanding and greater appreciation of how nature works.

Phenology provides predictable, season-based, real topics to study outside at a natural area, on school grounds, and in your back yard.



Why Phenology?

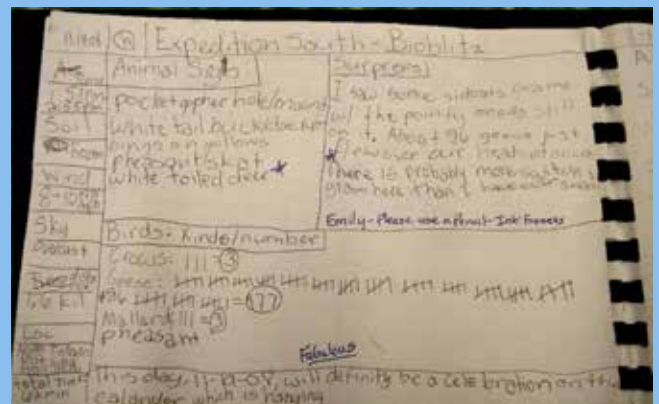
- Phenology delivers real numbers, authentic data to study indoors.
- Mathematical concepts studied in real time are easier to comprehend.
- Vocabulary expands significantly.
- Phenology creates opportunities for students to become better, more reflective observers.
- Students gain experience using calendars.
- Collecting information on a wide range of nature events offers topics which can be used for:
 - ✓ Writing – enriched word lists, events, personal situations.
 - ✓ Graphing data and interpreting graphs.
 - ✓ Graphic organizers – phenology data drawn from direct experience requires information organization.
 - ✓ Venn diagrams for comparing and contrasting.
 - ✓ Instruction in critical thinking and problem-solving.
 - ✓ Legitimate support of local, state, and national education standards.
- An unexpected health benefit for the human heart ... The reassurance and peace of mind that come from observing the order and structure in nature.



“My biggest wonder was the female mallard because I thought it was a different bird.”

BIOBLITZ!

For a greater challenge, try an educational Bioblitz, a survey which results in a snapshot of biological diversity. Split your page into quadrants, one for each taxonomic group, such as Invertebrates, Birds, Mammals, Reptiles/Amphibians. Depending upon the time of year, you could also include blooming, budding, or seeding plants. Walk a route or search an area for as many different living things as you can find in the time span available. Identify them as close to the species level as possible and record their names. Which group had the greatest variety of species? The least? Why? Repeat on a monthly or seasonal basis to track changes over time, to look for patterns in data, and to unearth discoveries about the phenology of your place .





Naturalists

The third point in the Compass to Nature comes from the vibrant, dynamic world of naturalists, both present and past. Here is a quick, practical definition of a naturalist: a person who studies nature. Naturalists are people who prefer to spend more time outdoors than in. They may be any age, any gender, exist in every land, urban-suburban-rural, and are perhaps most ubiquitous and holistic in indigenous cultures. There are many synonyms for the term naturalist, such as conservationist, environmentalist, preservationist, natural historian, life scientist, and so on. Naturalists may be amateurs like bird watchers and gardeners, or they may be professionals like ornithologists and farmers. In your application of the Compass to Nature, you do not have to use the term naturalist. You can choose any synonym you prefer which best fits your purpose, geographic region, and local values.

Like other scientists, naturalists make observations, record data, and share their discoveries with others and with the broader community. They are skilled in exploring, observing, organizing, collecting, describing, inventing, and experimenting. In addition, many naturalists are skilled artists and writers, daring travelers, inspiring speakers, and innovative researchers. It is naturalists who developed the concepts of species, extinction, and microorganisms, who invented microscopes that could make bacteria visible to humans. The contributions, passion, and purpose of naturalists improve our quality life and call us to live in balance with the land.



Contemporary, professional, western naturalists tend to specialize in a specific area of study, are college-educated, high-tech, and work in nature centers, zoos, parks, and museums. While their direct, first-hand observations may be made outdoors in nature, be it a sidewalk crack or a wilderness area, they frequently and quickly acquire knowledge from second-hand encounters or sources.

An informal study of famous North American naturalists such as Byrd Baylor, John Muir, Dr. Charles Eastman (Ohiyesa), George Washington Carver, Rachel Carson, and others, reveals that naturalists have common characteristics, even as children. They are prepared, quiet, observant, patient, curious, respectful, full of wonder, in the moment, and sharing. These positive qualities tie in well with character education and can be practiced by aspiring naturalists of any age or place.

A NATURALIST:

- Prepares to be outside safely, comfortably, and enjoyably.
- Is adventurous - explores, travels, and seeks out nature.
- Respects nature and the life found there. Respect transfers to personal relationships.
- Is curious and asks questions. Inquisitiveness and curiosity transfers to all learning.
- Tries to be still. To see and hear more, be still. Stillness applies in many areas of life.
- Waits patiently.
- Is observant - learns to pay close attention to changes and differences over time.
- Is full of wonder. Nature provides an endless source of amazement.
- Is a problem solver using clues to explain natural events.
- Keeps records - learning how to organize both numeric and written records.
- Thinks reflectively and analyzes information.
- Shares experiences, delight, and discoveries.



Naturalists *Approaches For Educators*

In the Compass to Nature, Place answers the question WHERE will I teach?

Phenology answers the questions

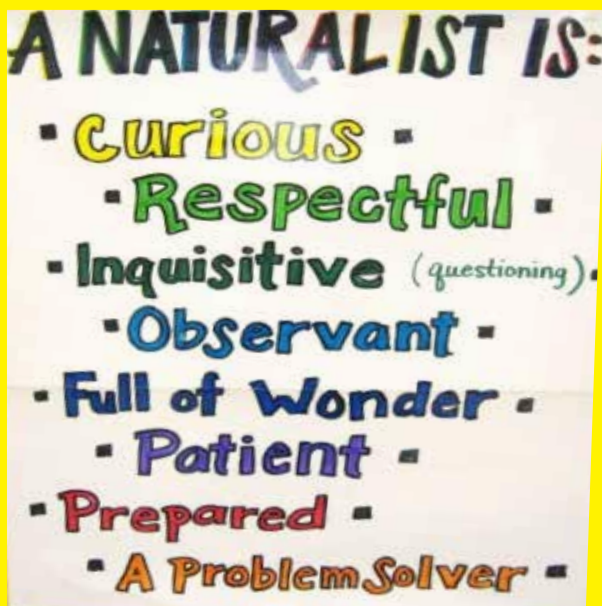
WHAT will I teach, and WHEN will I teach it? **Naturalists answer the question: WHO will I teach about?**

For starters, you can teach about the lives of famous naturalists. Study their lives and reflect on ways to

incorporate their ideas into your teaching practice.* By their example, naturalists have much to teach us about being scientists. These individuals serve us as teachers in absentia because many of them have left a legacy of art, writing, audio/video-recordings, or research. They reach out to us through their clear, exciting descriptions of nature and their energizing example of being immersed in and participating in nature. Read what they have written. Library books, web sites, magazine articles, museums, and parks provide a wealth of information about their life stories: their discoveries, methods, struggles, and recognition. Learn from naturalists as a naturalist yourself, and encourage others to do the same. From their accomplished lives, we can learn how we can become more proficient naturalists ourselves as adults (educators) and children (students).

Integrating the use of naturalist traits in a variety of ways provides the repetition needed for learning a new social skill or honing one – the skill of how a naturalist behaves with nature and with other naturalists. Repetition is an excellent teacher.

***You can adapt naturalist traits to suit your needs.**



INCORPORATE POSITIVE NATURALIST BEHAVIORS THROUGH THE SCHOOL YEAR:

- A short list of naturalist behaviors posted indoors for all to see becomes rules of behavior in the field, without having to call them “rules.” When children are loud outside, they can be reminded that “quiet naturalists see and hear more animals,” for instance.
- As the responsible adult guiding their experience, children will turn to you as a naturalist model. When you demonstrate and practice naturalist traits in the field, they will pick up cues from you and mimic your actions. Like repetition, an essential way children learn is through imitation.
- Choose one naturalist or a group of naturalists to study in depth on a repeat basis through the year. Closely examine how these naturalists behave outdoors and use them as role models for yourself and your students. Supplement this study with other naturalists on a monthly basis and in less detail but once introduced, refer to them as needed through the year as appropriate. Remember to find out and share what your naturalists were like as children, too, as your students will most easily identify with that stage of life.
- Studying a diversity of naturalists such as past and present, male and female, urban and rural, rich and poor, and from various cultures means more of your students will find at least one naturalist they can personally and closely identify with and emulate. It also underscores that anyone can be a naturalist. The world of nature and its mysteries and delights are open to all people.

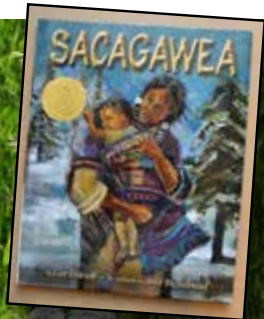


Naturalists

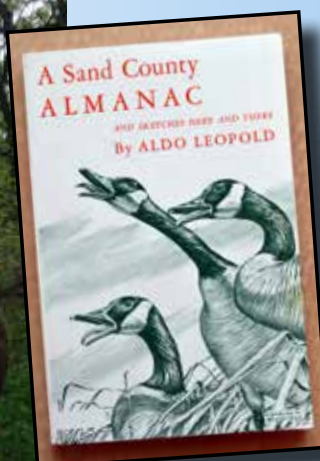
You can further glean ideas from other naturalists by examining together their artwork, their writing, or their biographies. The writings and thoughts of naturalists are a rich treasure; absorbing, truly enlightening reading with insights to nature that are well worth the time needed to investigate them. Studying the lives of naturalists provides immediate connections for an integrated use of the outdoor classroom. Try a few of these literature launchers to get the ball rolling – or to keep it moving.



- Read children's books by author Byrd Baylor. Then do what she suggests in her books together outside. Play the favorites game. Search for a rock using her rules. Listen another way. Record celebrations. Find your own best secret place.



- Read Sacagawea by Lise Erdrich. Then explore outdoors on a class expedition. Prepare by dressing for the forecasted weather. Practice traveling quietly as a team. Search for and sketch edible and medicinal plants that grow nearby. Find out what the names of these plants are in the native language of the indigenous people of your area. Wonder in awe at something you have never seen before as Sacagawea must have at the ocean and the whale. Return to this same area in a different season for a repeat expedition. Can you recognize and navigate where you first traveled? What changes have taken place since then?



- Read excerpts from Aldo Leopold's book, A Sand County Almanac. Depending upon the time of year and the excerpt you read, then go out in the field to notice the wind, listen to goose music, track animals, read the land, determine home range, and observe prairie birthdays (or woods, wetlands, desert, tundra, or river birthdays, depending upon where you live).



Naturalists

Closer to home and striking a chord with **PLACE**, you can choose to teach about area naturalists who are relevant because of their part in your local or regional conservation efforts. These naturalists are often easier to access and meet in person. Reach out to nearby conservation clubs, reservations, parks, or refuges and request recommendations for names of local, active naturalists.

While you can learn from any individual, you might be surprised to discover that a famous naturalist has a personal connection to your region, making them especially relevant for your students. Consider the places where famous naturalists lived and worked and choose accordingly. For instance:

- Dr. Charles Eastman (Ohiyesa) was born in Minnesota, grew up in Manitoba, and was educated in North Dakota, Wisconsin, Illinois, New Hampshire, and Massachusetts. He practiced medicine in South Dakota and Pennsylvania. He advocated for his tribe in Washington D.C. and London, England and lived the remainder of his life near Lake Huron in Ontario, Canada, and in Detroit, Michigan.
- Byrd Baylor has lived her entire life in the desert southwest of the United States (Texas and Arizona) and northern Mexico.
- Ernest Thompson Seton was born in England. He farmed prairies of southern Manitoba, Canada as a young man. During the blizzard of 1887, he rode a train through Minnesota. As an adult he lived in Connecticut and New Mexico.
- John Muir was born in Scotland, immigrated to Wisconsin, worked in Indiana, hiked the Appalachian mountains, walked 1,000 miles from Kentucky to Florida, traveled by boat to Panama and on land across the isthmus, then by boat up to California. He hiked through several western states, into Alaska, and explored the Amazon and parts of Africa.



You can connect some naturalists to **PHENOLOGY** in the Compass to Nature. Many naturalists have published books about how nature changes through the seasons including Anna Botsford Comstock ([The Handbook of Nature Study](#)), Aldo Leopold ([A Sand County Almanac](#)), Ernest Thompson Seton ([Trail of an Artist and Naturalist](#)), Sigurd Olson ([The Singing Wilderness](#)), Larry Weber ([Backyard Almanac](#)), and Paul Gruchow ([Journal of a Prairie Year](#)).

Aldo Leopold, his daughter Nina Leopold Bradley, and currently the Aldo Leopold Foundation have monitored and recorded phenological events in Sauk County, Wisconsin, for a total of 43 years since 1936, more than 80 years so far. This data set has contributed to studies in climate change for that state and is available on-line through Climate Wisconsin and through the Proceedings of the National Academy of Sciences of the United States of America. You can view Leopold's journals and other written materials through the University of Wisconsin digital collection on-line.



Why Naturalists?

With the advent of the industrial and technological ages of the 1800s and 1900s in western societies, numerous people have further detached from the natural world. Many of us have become primarily indoor people. We are increasingly losing the diverse skills, languages/vocabulary, foods, knowledge, values, and awareness associated with a life lived directly beneath the sky. Using the Compass to Nature, naturalists of the past and present help us navigate a way back into the very nature that gives us clean air to breathe, clean water to drink, nutritious food to eat, sturdy shelter to live in, safe space to play in, plus the original classroom -- an intriguing outdoor classroom -- to learn in.



The world needs naturalists!

Naturalists become effective students and understanding adults who...

- improve thinking skills.
- develop bonds with fellow students through nature.
- ask in-depth questions.
- show increased respect.
- develop excellent observation skills.
- teach others to become naturalists.
- are better equipped to care for the earth we need for life as the next generation of adults.

“Naturalists form a key link between common and scientific understanding. By becoming a naturalist, you are taking a place in an important tradition of knowledge keepers. Naturalists make the world accessible to all and bring out our interest in and wonder at nature.”

The California Naturalist Handbook by Greg de Nevers, Deborah Stanger Edelman, and Adina Merenlender

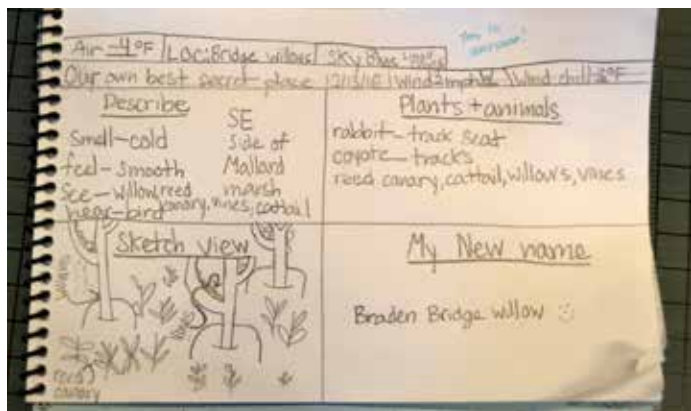


Journals

You are invited to move the science notebook outside to develop a unique written record of discoveries in your nature place and create a powerful tool for learning and discovery about the world we live in.

A journal can be purchased or homemade and any size or binding. It can include numbered pages, a table of contents or index, and a basic and consistent structure (title, date, location). You can find three languages in a field journal: words, numbers, and images. Words can include names, descriptions, lists, free-writes, thoughts, and questions. Numbers can include dates, predictions, tallies, counts, surveys, censuses, measurements, benchmarks, distances, estimates, and weather. Images can include sketches, maps, cross-sections, photos, diagrams, colors, rubbings, silhouettes, foot prints, soil, and mud.

A journal's content is not just factual or just emotional – it is both. It can contain both personal expressions and objective observations. Objective information might include scientific experiments, weather, wild-life behavior, and seasonal changes. Thoughts, ideas, emotions, and dreams may comprise a few personal responses.



NOTE: We use the terms nature journal and field journal interchangeably. Other synonyms include almanac, diary, daybook, chronicle, logbook.

“Nature journaling is the process of keeping a place-based, personal record of events, observations, and experiences in the outdoors.” says Kate Hofmann in her Nature Journaling guide. That process is typically an ongoing one. Students learn journaling best by journaling on a repeat basis.

Compared to journals in general, a nature or field journal is unique in that **PLACE** takes on a central role as the main subject, with the journalist as observer. “There is a deeper awareness of the setting, seasons, and other species,” says Hofmann. A journal may be a phenology log; a field guide to animals, plants, geology; and an explorer’s log of journeys and findings. It may also be a collection of reflections about a place and connections with it. Merge the power of a science notebook with the engagement of the real life found in nature. Write about nature discoveries and the thoughts they bring.

“The field notebook may be made a joy to the pupil and a help to the teacher. ... It is a friendly gate which admits the teacher to a knowledge of what the child sees and cares for... where the child’s attention impinges upon ... and where to find the starting point for cultivating larger intelligence and wider interest. ... These books, whatever quality, are precious beyond price to their owners. And why not? For they represent what cannot be bought or sold, personal experience in the happy world of out-of-doors.”

Anna Botsford Comstock
Handbook of Nature Study



Journals *Approaches For Educators*

Regardless of an educator's curricular focus, the journal can be the main tool in a study of nature.

The daily life of a learner, child or adult, can become significantly enriched when use of a field journal becomes a part of the daily, weekly, or monthly routine. In the Compass to Nature, Place answers the question WHERE will I teach? Phenology answers the questions WHAT will I teach, and WHEN will I teach it? Naturalists answer the question: WHO will I teach about? **Journals answer the question HOW will I teach?**

You can start with your students and learn alongside them, or develop your own journaling practice before introducing it to them. Or you could try a combination of both.

Although many students will need some help getting started, one need not be an expert naturalist, writer, or artist to guide others in nature journaling. Enthusiasm, a wide range of field activities, and journaling and discovering alongside students draws them in, inspires them, demonstrates the value of journaling, models desired behavior, and allows instructors to enjoy the benefits of journaling, too. The instructor is more aptly named the collaborator, guide, coach, or facilitator. Use a nature journal yourself. Develop a journal habit.

Journal Basics:

There is no one way to create a field journal. The most important aspect is to start. Go outside, observe the world around you, open that book to the first blank page, and start to record your observations and thoughts. If you prefer a more structured approach you can begin with these simple, optional steps.

1. On the inside front cover, include your name, date, contact information (in case your journal is lost).
2. Add a map of your site for reference to the inside back cover.
3. Number each page (or evens or odds).
4. Consider saving pages at the front or back for contents/index list, species lists, or phenology lists.

Now your journal is ready for standardized, repeat entries.

5. Give each new entry a clear title, date, and location.
6. Record the weather each time you journal – using instruments or estimates:
 - Air, water, snow, ice, soil temperatures
 - Wind speed and direction
 - Wind chill
 - Sky (light, clouds, precipitation, moon phase)

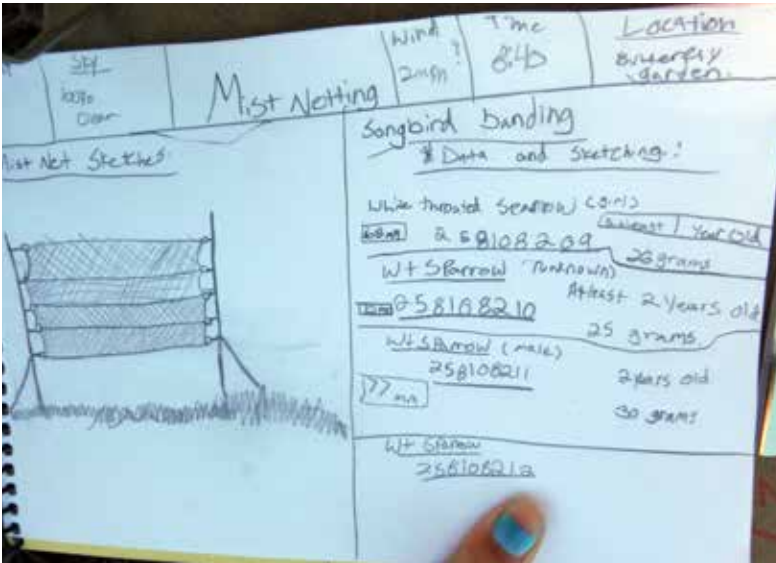


You can reserve the very top of each entry for steps 5 and 6 above, and then the majority of each page will be unique depending upon your purpose and discoveries. A convenient format is quadrants, each reserved for a specific purpose related to the page title. Experiment with page layout. Each page does not have to be identically organized.

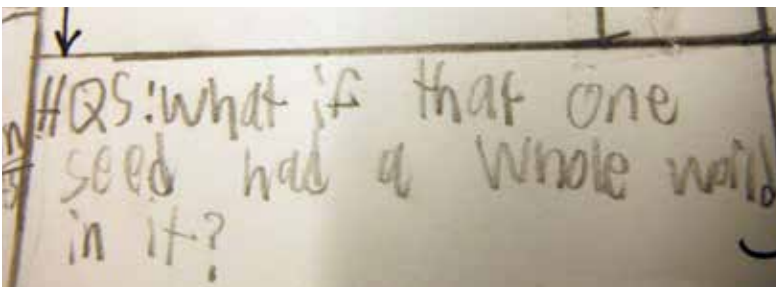


Journals

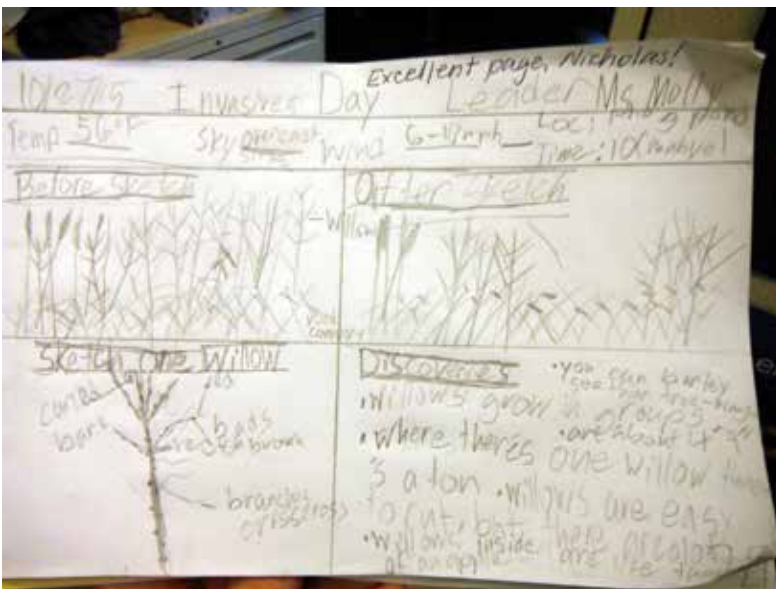
Try these ideas as you begin to keep a nature journal:



Use a journal to record data.



Use your journal to ask questions and wonder.



Use captions and sketching to illustrate what you see.

- ✓ Observe first, record second.
- ✓ Use your senses and record sensory observations (smells, sights, sounds, touches, tastes)
- ✓ Count things. Measure. Tally. Estimate. Benchmark.
- ✓ Look for uncommon beauty in common things...you will be delighted.
- ✓ Illustrate observations, discoveries regularly with sketches, rubbings, specimens, maps, photos.
- ✓ Use colors.
- ✓ Label sketches.
- ✓ Go to the next page if one isn't enough.
- ✓ Return to the same place over and over for observation.
- ✓ Think about what you are learning. Reflect on it in your journal.
- ✓ Be still, look for meanings.
- ✓ Ask questions, and write them in your journal.
- ✓ Wonder! Search for the amazing. Record beauty. Create a list of things that take your breath away.



Journals

Nature is the true source of inspiration for a nature journal. Observing nature is more important than writing and is the heart of the journal. Students should observe first and write second because observing is what gives them something to write about. Once writing begins, it may be helpful to look back and forth between the page and the subject. Journals can also include sketches, rubbings, maps, colors, tables, measurements, questions, awe, surprise, mystery, joy, and splendor. Avoid editing for spelling, grammar, and punctuation in the field. However, editing for accuracy in content is a valuable use of time and essential to the field journaling process.

While in the field, students should be encouraged to record information without using field guides or textbooks because this encourages them to improve their own observation skills. Back indoors, students can refer to their journal entries to research and find more information about what they observed. With advanced training and practice, they may even use their journals as a tool to accurately identify unknown plants and animals.

After students have completed their journal entries, providing an opportunity to share their observations with others in their group can further increase learning. Sharing provides students with the opportunity to show what they saw and discovered. It can help students see the diversity of observations that can be made in nature and the assortment of journaling styles among students. Further, teachers are afforded a valuable glimpse at students' metacognition. Key to deeper thinking, reflection time allows students to process their experience intellectually and emotionally, infer meanings, and draw connections and conclusions. Such is the journey that journaling can lead as students make discoveries about their home biome and also about themselves.

As you may have suspected, a field journal is not limited to science. In fact several academic subjects unite in it. Interdisciplinary, integrated, a nature journal is endlessly adaptable.

Why Journals?

For centuries naturalists have used field journals to record data, observations, and reflections about the natural world they were examining. Historical journals provide a legacy of wisdom and knowledge, snapshot glimpses of the past that indicate changes over time. Through the ages, scientists, artists, authors, poets, explorers, and many others recorded their experiences including Leonardo da Vinci, Charles Darwin, Carl Linneaus, Thomas Jefferson, Meriwether Lewis and William Clark, Olaus Murie, Anna Botsford Comstock, Robert Kennicott, Aleta Karstad, Clare Walker Leslie, and Rachel Carson. Some naturalists even started a lifelong practice of journaling in childhood, including John James Audubon, Ernest Thompson Seton, and Aldo Leopold.

John Muir wrote in his journals "about the beauty he saw in nature. He also drew sketches detailing information about plants, animals, mountains, glaciers, and landscapes." His journals gave him a wealth of recorded experience, and Muir used them to compose letters to friends, 200+ articles, and 10 books. In his writing he shared his love of nature and enlisted support to preserve wilderness. "People continue to gain insight into nature's beauty and importance in our lives from his writings." (Sierra Club) Likewise student journals can be a source of raw data and information from which to write poems, reports, and speeches or develop posters, songs, art, and other polished work.



Journaling can be a quiet activity and a way to share observations.

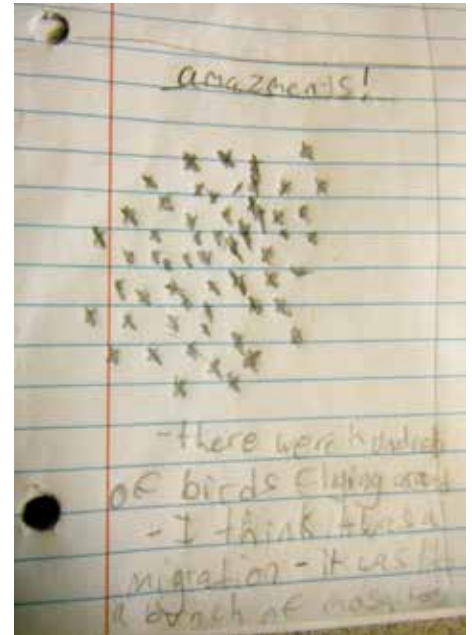


Journals

Keeping a nature journal can be a powerful experience because it helps the observers slow down, carefully take note of their surroundings, make first-hand, concrete observations of nature, and become better observers. Good science depends upon keen observations, and nature journaling is an effective way to develop that skill. "Writing a fact makes one observe it better," Ernest Thompson Seton noted. Keeping a journal makes you a better observer, a valuable lifelong skill.

Intertwined with its value as a learning tool, keeping a journal allows time for reflection and relaxation. It allows thinking and feeling with both head and heart as a naturalist, a combination of intellectual learning about the environment and emotional connection and attachment to a place. Rather than rushing through a natural area, students have personal time and direct experience, which can help them feel more connected to the land and develop a sense of place.

As Dirnberger, McCullagh, and Howick state in *The Science Teacher*, "For many students, life in the artificial environment of climate-controlled schools, malls, and automobiles make the natural environment seem peripheral and irrelevant. In addition, formal learning is increasingly based on electronic, prepackaged information transfer." Yet science teachers know there is no substitute for direct experience to motivate and engage students. Done repeatedly over time, nature journaling offers sustained contact with neighborhood nature. Further, personally created nature journals provide students with ownership of their experiences and reinforce active learning. Students capture and claim moments with the world around them.



Children say that nature journaling is fun, interesting, exciting, makes you smarter, and helps you relax and remember. They also say they should journal because nature is beautiful, it's peaceful to be alone sometimes, and nature is full of surprises at every turn.

ADVANTAGES OF JOURNAL KEEPING:

- It gives you a significant purpose to be outside.
- It is a flexible teaching tool which is easily integrated with all curricular areas.
- It is adaptable to all learning styles and abilities and a source of endless individualization possibilities.
- It easily showcases the scientific process and documents how the natural world works.
- Field journaling provides opportunities for authentic learning which incorporates writing and drawing as major elements and therefore uses verbal, nonverbal, analytic, logical, spatial, and synthetic abilities.
- Using a journal allows students to lead their learning with their own questions making it student and inquiry driven.
- Using the journal improves observation, organization, reading, writing, math, art, problem solving, and critical thinking skills.
- It serves as a scientific record of your school year with nature, a convincing assessment tool for teachers and parents.



The Sense of Wonder

While connecting the human heart to nature, there is one recurring dynamic. When this force is missing or omitted, the human heart soon becomes disinterested and disconnected. The Sense of Wonder invisibly holds the four components of the Compass to Nature in a cohesive, relevant, and appealing entity.

eye-popping, breath-taking, spine-tingling awe.

A traditional navigational compass identifies north, south, east and west. The compass needle spins. The red end points to magnetic north regardless of how the compass is oriented. The Sense of Wonder is the irresistible magnetic force for the Compass to Nature.

Simply described, the human Sense of Wonder is the equivalent of awe. Synonyms for awe all add to a description of wonder: admiration, respect, amazement, surprise, astonishment, esteem and veneration. There are two kinds of wonder. Questions are one kind. While questions about nature are always desirable, they are not quite the same as heart pounding,

“A compass would not be useful, in fact, would not be a compass at all if the needle was not free to pivot. Similarly our Compass to Nature model would not be useful if we had no sense of awe and wonder to activate our contemplation of various aspects of the natural world.” -- Ken Brennan, volunteer at Sherburne National Wildlife Refuge.

Approaches For Educators

In the Compass to Nature, each compass point fulfills a purpose in teaching outside.

COMPASS DIRECTION	PURPOSE	FULFILLMENT
Place	WHERE I teach	Teaching outside my door in my local environment as often as possible
Phenology	WHAT I teach about WHEN I teach it	Teaching about local nature according to nature’s calendar
Naturalists	WHO I teach about	Using people who enjoy nature as role models for behavior
Journals	HOW I teach	Interdisciplinary, integrated, hands-on, reflective

The Sense of Wonder fulfills the purpose of WHY we teach outside. When children have the opportunity to learn outside, their Sense of Wonder is kindled and motivates their desire to learn.

Many naturalists have exemplified the Sense of Wonder like Ernest Thompson Seton and John Muir. Still others have written a little bit about it including Sigurd Olson, Aldo Leopold, and E. O. Wilson. Because rediscovering the inborn Sense of Wonder in all of us is pivotal in connecting the human heart to nature, Rachel Carson is a naturalist who stands unique among naturalists.

“In the last 10 years or so, there has been a push for teachers to be data driven and talk about a Common Core. But we forget about the heart of children. That’s the most important part of the job. We need to get to their heart with the material that we teach. ... Education is the platform for you to discover and question the world and wonder and have hope...”

Abdul Wright, Minnesota Teacher of the Year, Minnesota Educator publication of Education Minnesota, June 2016



The Sense of Wonder

To gain a deeper understanding of the Sense of Wonder, there is no more effective means than to read Rachel Carson's short treatise on it. It can be purchased as a book called The Sense of Wonder, or you can access it for free on-line as the original essay titled, "Help Your Child to Wonder" (Women's Home Companion magazine, July 1956). It holds in unified interrelation, a study of place, understanding of phenology, use of a nature journal, and learning from a naturalist.

The Sense of Wonder still inspires people who work to promote the study of nature. In writing it, Carson wanted to help parents gain confidence exploring nature with their children. She thought nature exploration and study were crucial to a child's development and well-being. It seems too simple. Yet it is deeply profound. The Sense of Wonder ... an enduring resource of ideas to connect others with nature ... worthy of repeated readings.

Connect People with Nature ...

Apply Rachel Carson's Sense of Wonder Principles :

Protect the Sense of Wonder found in all children (often lying dormant in adults). Help children and adults find wonder in the world we live in. Discover wonder first when you go outside.

- **Seek out adventures.** "It was hardly a conventional way to entertain one so young ... and is based on having fun together rather than on teaching."
- **You do not have to be a nature expert.** Just go "through the woods in the spirit of two friends on an expedition of exciting discovery." "You do not need to know names of things." "... it is not half so important to know as to feel." "You can still drink in the beauty, and think and wonder at the meaning of what you see."
- **Interact with nature directly using all of your senses, not just sight.** Exploring nature ... "is largely a matter of becoming receptive to what lies all around you."
- **Embrace inconveniences** like wet clothing, muddy floors, and losing sleep. "I think we have felt that the memory of such a scene, photographed year after year by his child's mind, would mean more to him in manhood than the sleep he was losing."
- **Go low-tech.** Study the world of little things. "An investment of a few dollars in a good hand lens or magnifying glass will bring a new world into being."
- **Accept all kinds of weather.** "Now I know for children, too, nature reserves some of her choice rewards for days when her mood may appear to be somber."
- **Find unnoticed beauty.** Ask yourself, "What if I had never seen this before? What if I knew I would never see it again?"

These principles may be followed by teachers with education degrees, biologists with science degrees, adults who wish to make a lifetime difference in the lives of others, or parents with love in their hearts. They will work during the school day, after school, on weekends or weekdays. Wonder never fails.

You are busy. It is easy to become preoccupied with distractions like chores, standardized testing, and deadlines. However, don't be too busy to teach your children and yourself to wonder. You are more than a brain on top of a body. You also have a heart. So do the children and adults that you teach. Here are the basics. Introduce wonder to your students...

The Sense of Wonder Circle:
"Experiences along the circle will awaken your curiosity, lead to explorations and discoveries, and inspire you to share your discoveries and sense of wonder with others. Ultimately, those experiences will lead you to care passionately for the earth."

From the book Teaching Kids to Love the Earth by Marina Lachecki Herman, Joseph F. Passineau, Ann L. Schimpf, and Paul Treuer.



Sense of Wonder Lesson Plan

Time: 40 minutes total: 10 minutes introduction, 20 minutes outside exploring, 10 minutes reflection

Objective: To introduce the Sense of Wonder to your students.

Materials: A t-chart (smart board, white board, or even a large sheet of poster paper), journals, pencils

Hook Your Class: Ask - *Do you have 5 senses or 6?* Discuss human senses. Make a wonder t-chart:

Questions

Ask for examples of questions.

Amazements

On this side, share that 1000s of things outside can amaze us such as beauty, mystery, and surprise. These things also bring joy, delight, and thrill. Ask them to share other words about how nature amazes us. Build a class list.



Explore Outside: Go on a wonder hunt. Look for wonder, listen for wonder, smell for wonder, feel for wonder, and think about wonder. Record found wonders using words, images, and numbers. Inside, ask students to share their wonder (amazements). Create a class list of these discoveries.

Most important: After this introduction, make a search for wonder a frequent and regular practice. A hunt for wonder in nature will delight both you the teacher and your students, enhancing learning. Keep wonder in your daily routine, as it is never, never dull!

In connecting the human heart to nature, wonder is your goal. Each time you are outside with others guide them to find the awe in nature. It is always present. Become a wonder connoisseur.

The idea that all of humanity has more than five senses originates with Rachel Carson and can be passed on by you. Watch the children you are with become excited with the natural world. We can learn from them. Rekindle your own Sense of Wonder diminished by adulthood. Then teach those you are with to wonder about the world we live in.





Why Wonder?

An educator who uses the outdoor classroom has an infinite number of tools available to motivate students. Possibly the strongest of them all is the Sense of Wonder. Rachel Carson reminded us that "If a child is to keep alive his inborn Sense of Wonder, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in."

You get to be an adult who shares in the joy, excitement and mystery of the world we live in! You could be the person who helps others begin a lasting study of the wonders of the natural world. Yes, you can be that person. Wonder will change your teaching; it will change your relationships with your students. You will like having your class as companions. Daily, you can search for the wonder that is just outside your windows. You can seek wonder as you get your students in the moment each day. You can hunt for wonder when you use the outdoor classroom. As you teach them to wonder, you will be surprised. They see and are amazed by things your adult mind and heart misses. Become a wonder collector with your children. Pursuing wonder will impact your entire classroom and provide new motivation for learning!

Rachel Carson explains, "It is not half so important to know as to feel. ... It is more important to pave the way for the child to want to know than to put him on a diet of facts he is not ready to assimilate. ... If facts are the seeds that later produce knowledge and wisdom, then the emotions and the impressions of the senses are the fertile soil in which the seeds must grow. ... Once the emotions have been aroused – a sense of the beautiful, the excitement of the new and unknown, a feeling of sympathy, pity, admiration or love – then we wish for knowledge about the object of our emotional response. Once found, it has lasting meaning."

Motivation for learning is just the beginning. There are additional exciting reasons to take the time to wonder. Carson poses this question, "What is the value of preserving and strengthening this sense of awe and wonder, this recognition of something beyond the boundaries of human existence?" She gives many clear reasons. Wonder provides inner contentment and renewed excitement in living; healing reassurance in the repeated refrains of nature; infinite curiosity; a cure for boredom, disillusionment, loneliness, and fatigue. Perhaps best of all, "Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts." The Sense of Wonder never expires but lasts a lifetime. Step out any door and it is available to all who place themselves "under the influence of earth, sea, and sky and their amazing life."



In 1956 a respected and gifted scientist and author wrote a prescription for all people involved in the life-changing enterprise of connecting children and adults with nature. This prescription is straightforward and down-to-earth. Like all prescriptions the aim is improved health: physical and emotional and mental. The prescription has little if any cost; no bank loans needed. An inexpensive hand lens is really the only standard equipment required. However, there is a necessary investment: personal time.

This prescription encourages every earth resident to spend time outside on a regular basis.

Rachel Carson wrote the prescription. It comes today in the form of a book called The Sense of Wonder and provides an uncomplicated approach to enabling others – especially children -- to come to delight in the marvels of the natural world we live in.

Will you pick up your prescription? Will you share wonder with others? You will be amazed.



TOP 10 FIELD ACTIVITIES

#1 SETON WATCH

ACTIVITY DETAILS Patterned after a nature observation technique of Ernest Thompson Seton. The objective of this activity is to sit still - quietly watching until animals, birds, and wildlife around the observer resume normal activity. Sometimes a person who is Seton Watching is surprised by something unexpected.

MATERIALS Student/Teacher field journals, pencils (sometimes colored pencils for sketching). One journal page titled Seton Watch (include the date and location).

TIPS FOR SUCCESS An effective way of getting visitors or students placed is to walk them in a single-file line with the leader picking the spot for the student to sit. Goal: All sit, without talking, while observing nature and journaling what is observed. You may wish to try a group Seton Watch before attempting solo Seton Watches. Also, it helps to start with a short amount of time, working your way up to longer periods of time as the year goes on.



#2 BIOBLITZ

ACTIVITY DETAILS A monthly or seasonal activity. A Bioblitz consists of the field leader and students walking a route in the outdoor classroom to observe and record: bird species, mammal species, plant species, land and aquatic invertebrates, reptiles and amphibians. These observations should be recorded in student journals and later on a class Bioblitz record.

MATERIALS Student/Teacher field journals, pencils. One journal page titled Bioblitz (include the date and day)

TIPS FOR SUCCESS Seton Watch quietness is very helpful for this activity. The field leader and group walk slowly along the route, observing and recording as many different living things as possible, identifying them down to the species level or as close to that level as possible with 100% accuracy. The same route can be used each time if desired. Goal: obtain a snap shot of biological diversity for a certain place and time. A Thinking Question: predict how a winter Bioblitz might differ from fall? How spring might differ from winter? Summer from spring?





#3 AQUATIC LABS

ACTIVITY DETAILS If your outdoor classroom has a wetland, lake, or river, this activity will provide students and teachers with a glimpse into the world of macro-invertebrates. Using field equipment, students sample, identify and discover aquatic invertebrates.

MATERIALS Student/Teacher field journals, pencils. (Title this one Aquatic Inverts or Aquatic Life.) Also: dip nets, plastic dish tubs, dichotomous keys, hand lenses, and a guide to aquatic invertebrates.

TIPS FOR SUCCESS Discuss and explain the use of the dichotomous key. A free, printable online version is available from the University of Wisconsin - Extension. Use a figure 8 motion to sweep water at high, medium, low depths — be careful to keep mud out of sample. Reverse the net in the tub to rinse out invertebrates. Before identifying, have students observe without talking. Search for colors, movements, shapes, predator-prey, exoskeletons, and life cycle stages. Find out what they smell and feel like, too!

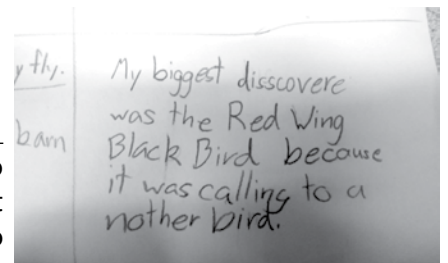


#4 DISCOVERY HIKES

ACTIVITY DETAILS A Discovery Hike is just what the name implies: a hike to discover what is happening in nature at the time. It is often best to have no set agenda--just walk to see what nature provides. Be flexible, encourage students to look for surprises!

MATERIALS Student/Teacher field journals, pencils. Set up page with title, weather data box or bar.

TIPS FOR SUCCESS Prepare students before going into the outdoor classroom by asking them to predict what they might observe with their different senses. Build a list; compare this list with what was discovered. Follow Byrd Baylor's lead – spend the day admiring things. Check on how things are doing.



#5 LAYBACK

ACTIVITY DETAILS The Layback could be combined with a Discovery Hike or any of the other activities on this list, especially the Seton Watch. The Layback is best on a day when the ground is dry. When your students have become acclimatized to sitting on the ground, invite them to lay back on the ground!

MATERIALS Student/Teacher field journals, pencils. Try sketching to capture the shape and look of the sky.

TIPS FOR SUCCESS This activity quickly becomes a favorite of most children once they are used to sitting on the earth. The first time, you may wish to guide them through using their senses to listen to the sounds around them, feel the earth underneath their bodies, smell the air and grasses, and look near, far, and to the sides. A fun alternative is to flip over and lay on the other side. When everyone is done ask students to fluff up the flattened area where they lay in an attempt to Leave No Trace of your presence. LNT!





#6 OUTDOOR ALPHABET

ACTIVITY DETAILS

Find letters of the alpha-bet in nature using natural objects you can see. Sketch each letter as it appears in your journal, and label what the natural object is.

MATERIALS Pencils and journals. Colored pencils are an option. A place outside preferably one with natural objects within easy viewing distance.

TIPS FOR SUCCESS

Introduce the Outdoor Alphabet with the book ABCs Naturally by Lynne Smith Diebel. Try spelling a word like your name in nature! Search for spelling words or phonetic skills like ch, sh, vowels, consonants, silent letters, etc. Use the Outdoor Alphabet every month or season because nature changes! Try it on a pond with at least 12 inches of ice. Brush away snow for a better look at the ice.



S



K



Y

#7 SOUND MAPPING

ACTIVITY DETAILS The Sound Map activity requires the development of patience and an increasing level of listening skill. In this activity, you and your students sit down on the earth to listen to the sounds occurring. The object is to create a map of the type of sound and its direction and distance from your position.

MATERIALS Student/Teacher field journals, pencils.

TIPS FOR SUCCESS On the journal page for the Sound Map have students place an X in the center of the page to represent themselves. Next draw a compass rose in one corner and a blank map key in another. Discuss with students what they may use for symbols on the map key. Go out into the field and experiment with the development of your sound maps. This is also an excellent problem solving activity! For example, to make it easier, you may wish to measure out 50 and 100 meter radiuses and draw these circles on your map. You may wish to use aerial photos of your site from the Internet. U.S. Fish and Wildlife Service biologists use a very similar technique for conducting breeding bird surveys every spring.





#8 WINDOWS

ACTIVITY DETAILS Windows is really an opportunity to study land invertebrates. It is called “windows” because the study method involves opening a “window” by gently pushing the curtain of plant material on the earth aside to see bare earth and what is on it.

MATERIALS Student/Teacher field journals, pencils. A page entitled: Windows. Sketches and written descriptions followed by research on the invertebrate are all a part of this.

TIPS FOR SUCCESS Prior to doing a “windows” activity or immediately after, introduce your students to possible land macro invertebrates: millipede, centipede, sow bug, springtail, spiders of your area, insects in season. The first time, guide them through the layers of plants gradually, depending upon your ecosystem, from trees to shrubs, to flowers and grasses, mosses and the bare soil. Even if you only have grasses and flowers, these plants have layers of their own. Move slowly, observing carefully. At each layer watch and wait for movements of small creatures to catch your eye as they pass by your window. Remind your students to “close the window” when done! (Leave No Trace)



#9 STUDY STATIONS

ACTIVITY DETAILS Study Stations are designed to get your students to begin to look for change in nature over time. In your outdoor classroom, select a place students can revisit repeatedly over an extended time, perhaps a whole school year, to observe and record the activity (plants, invertebrates, animals, birds, etc.) occurring at this place each time.

MATERIALS Student/Teacher field journals, pencils, rulers, meter sticks.

TIPS FOR SUCCESS With your students discuss and develop a continuing process of recording the changes. This activity can include teaching data collection, graphing, and the use of graphic organizers and more. Option: assign each student their own snow study station and visit these weekly through winter to observe how the snow pack develops and changes from storm to storm and with melting. Use your clipboard to make a single chop through the snow pack. What layers can you see? Record the temperature of the air and the snow. Are they the same? Why or why not? Look for the answer to that question in the snow itself.





#10 SKETCHING

ACTIVITY DETAILS Providing your students with skills in sketching is a significant tool in using the outdoor classroom. Sketching techniques to consider are: basic shapes, blind contour, gesture sketch, diagrammatic sketch, magnified sketch, landscapes, and line design.

MATERIALS NEEDED Student/Teacher field journals, pencils and a set of basic colored pencils. Just having the three primary colors is even enough as they can be mixed.

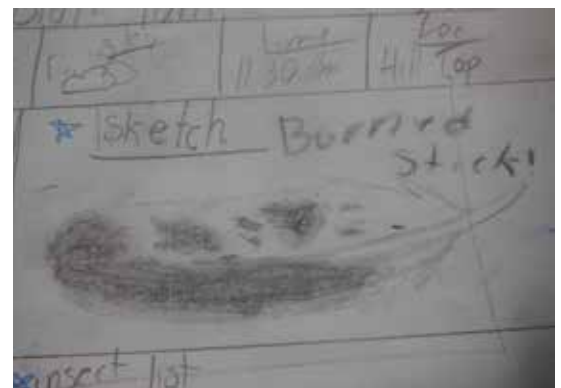
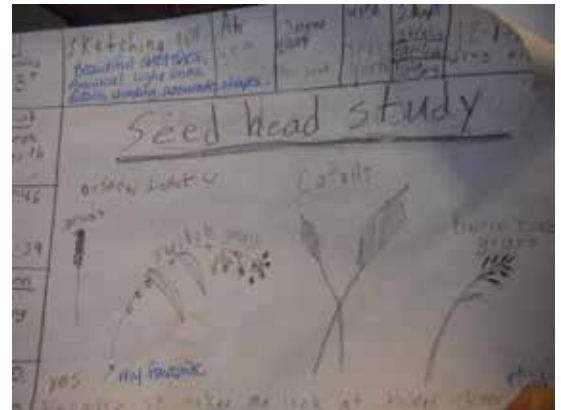
TIPS FOR SUCCESS Begin using basic sketching techniques early in the study of the outdoor classroom. Ernest Thompson Seton, naturalist, 1860-1946, once stated, "Nature journals should be embellished with diagrams, sketches or photographs which can help more fully to set forth the facts." Instead of using colored pencils, find colors in nature that you can use to show value and shading. Weed leaves, rocks, mud, charcoal, soil, etc!

BONUS! NO TALK IN THE FIELD DAY

ACTIVITY DETAILS This activity is exactly what the title suggests: No talking in the field.

MATERIALS NEEDED Student/Teacher field journals, pencils

TIPS FOR SUCCESS We humans are social creatures who need to talk. As Minnesota author and naturalist Sigurd Olson wrote, though, we need silence, too. The outdoor classroom is the perfect place for silence. No talking deepens and extends student observations skills. New insights and discoveries occur. Students like the quiet. You can start small with a no talking zone or corner – no talking from that point on. Have students write about discoveries and feelings in their field journals. If time allows, share aloud in a circle.





Shaping of the Compass to Nature has been influenced in part by the following abbreviated alphabetical list of publications and organizations. For each Compass point, underlined titles of books and magazines are listed first followed by organizations. You can find more information about any of these resources by searching for them on-line.

Place

- ✦ Beyond Ecophobia: Reclaiming the Heart in Nature Education by David Sobel
- ✦ Into the Field, a Guide to Locally Focused Teaching by Ann Zwinger, Clare Leslie Walker, John Tallmadge, and Tom Wessels
- ✦ Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder by Richard Louv
- ✦ Place-Based Education: Connecting Classrooms and Communities by David Sobel
- ✦ Center for Place-based Learning and Community Engagement
- ✦ Prairie Wetlands Learning Center, U.S. Fish and Wildlife Service
- ✦ State Education and Environment Roundtable, the Environment as an Integrating Context Model

Phenology

- ✦ A Sand County Almanac by Aldo Leopold
- ✦ Backyard Almanac, a 365-Day Guide to the Plants and Critters that Live in Your Backyard by Larry Weber
- ✦ Handbook of Nature Study by Anna Botsford Comstock
- ✦ Journal of a Prairie Year by Paul Gruchow
- ✦ The Phenology Handbook, a Guide to Phenological Monitoring for Students, Teachers, Families, and Nature Enthusiasts by Brian P. Haggerty and Susan J. Mazer
- ✦ Journey North/Journey South
- ✦ Prairie Wetlands Learning Center, U.S. Fish and Wildlife Service
- ✦ Aldo Leopold Foundation
- ✦ Leopold Education Project
- ✦ USA National Phenology Network

Naturalists

- ✦ Discovering the Naturalist Intelligence: Science in the School Yard by Jenna Glock, Susan Wertz and Maggie Meyer
- ✦ Guess Who My Favorite Person Is by Byrd Baylor
- ✦ Listening Point by Sigurd F. Olson
- ✦ Orion Magazine, "The Naturalist" by Barry Lopez, Autumn 2001
- ✦ Snowflake Bentley by Jacqueline Briggs Martin and Mary Azarian
- ✦ The Boy Who Drew Birds: A Story of John James Audubon by Jacqueline Davies
- ✦ Prairie Wetlands Learning Center, U.S. Fish and Wildlife Service

Journals

- ✦ By a Thousand Fires, Nature Notes and Extracts from the Life and Unpublished Journals of Ernest Thompson Seton by Julia M. Seton
- ✦ I'm in Charge of Celebrations by Byrd Baylor
- ✦ How to Keep a Naturalist's Notebook by Susan Leigh Tomlinson
- ✦ Keeping a Nature Journal, Discover a Whole New Way of Seeing the World Around You by Clare Walker Leslie and Charles E. Roth
- ✦ Nature Journaling, a Creative Path to Environmental Literacy, a Guide for Sinking Roots in Place and Branching Out Toward Environmental Literacy in Grades 4-8 by Kate Hofman
- ✦ The Science Teacher, "Writing and Drawing in the Naturalist's Journal" by Joseph M. Dirnberger, Steven McCullagh, and Tom Howick, January 2005
- ✦ John Hopkins University, School of Education, New Horizons for Learning, "The Nature Journal as a Tool for Learning" by Karen Matsumoto
- ✦ Prairie Wetlands Learning Center, U.S. Fish and Wildlife Service
- ✦ Sierra Club, "Keeping a Nature Journal" by Bonnie Johanna Gisel, Ph.D.; and John Muir information.

Wonder

- ✦ A Sand County Almanac by Aldo Leopold
- ✦ Listening Point by Sigurd F. Olson
- ✦ Naturalist by E.O. Wilson
- ✦ The Sense of Wonder by Rachel Carson
- ✦ Women's Home Companion, "Help Your Child to Wonder" by Rachel Carson, July 1956.
- ✦ Prairie Wetlands Learning Center, U.S. Fish and Wildlife Service