



# Teaching in the Outdoors

A Green Teacher ebook



Edited by Tim Grant & Gail Littlejohn

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# Introduction

Now more than ever, there is a greater need to get young people outdoors so they can see, understand, and commune with nature. We protect what we care about, and we care about what we know well. If students are encouraged to explore the natural world — to learn about local plants and animals, to observe and anticipate seasonal patterns, to get their feet wet in local rivers — they are more likely to develop a lifelong love of nature that will translate into a lifelong commitment to environmental stewardship.

*Teaching in the Outdoors* provides a practical guide for getting students outdoors along with helpful suggestions for maximizing the learning experience when they get there. It is a compilation of the best articles on this topic that appeared in Green Teacher magazine since we began publishing in 1991. Darius Kalvaitis summarizes the benefits of bringing students outdoors, while Laura Haspela and Susan Snyder offer tips for leading well-organized field trips. Nalani McCutcheon and Andrea Swanson share their “tips and tricks” to help you maximize learning and enjoyment when working with young people outdoors. Coming from the opposite direction, Glenda Hanna provides a road map for overcoming the administrative barriers that often stifle the outdoor education programs before they get started.

Beyond these broadly focused articles, are two other gems that delve further into specifics. In “The Caboose Hike,” Gloria Siers recommends the best ways to keep groups of young people engaged even when they are stretched out along a trail. Brad Daniel and Cliff Knapp wax poetic about high-engagement night hikes and how to encourage the magic associated with them.

We hope this book will inspire grand plans but at the same time provide the direction and tools to begin the journey in small, manageable steps. No matter how modestly you begin, you will be enriching young people’s lives, strengthening your community, and adding your vision and voice to the most vibrant educational movement currently underway.

**Tim Grant, Editor, Toronto**

# Acknowledgments

The first thanks go to the authors who share in these pages their wide-ranging knowledge, their diverse experience, and their passion for a new model of education. Each of them gave generously of their time in writing - and re-writing - their original contributions to *Green Teacher*, our non-profit magazine for youth educators. We're very appreciative of their willingness to allow us to re-print their articles in this ebook.

Secondly, I would like to thank four individuals whose work was central to the creation of this, the first ebook published by *Green Teacher*, and without whom, this book would not have been created.

Isabel Slone and Myriam Rizkallah undertook considerable research into everything about ebooks and summarized their findings in a manner that enabled our small staff to make timely decisions about all aspects of this project. More than anyone on staff, Isabel drove this project forward making sure that all its contents were readily available, while Myriam handled the design and overall production of the book.

This ebook was actually conceived a year ago. The two individuals who worked alongside me at that time to draft the contents of 20+ possible ebooks in English and in French were Brandon Quigley and Amy Stubbs. Among many preparatory tasks, they contacted over 800 past contributors to *Green Teacher* to obtain their permission for us to include their articles in this and forthcoming ebooks. Both contributed countless hours to our discussions of this emerging book format.

I am very fortunate to have worked with these four talented individuals.

**Tim Grant**



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Photo: David Nunuk







Photo: Cathy Jenkins

# Tips and Tricks for Taking Kids Outside

*Teaching in a classroom without walls can be discomfoting at first. Keeping a few pointers in mind will enhance the learning and enjoyment for everyone.*

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By **Nalani McCutcheon** and **Andrea Swanson**

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**I**N THE MIDDLE of the night, are you jolted from your bed by nightmarish images of children running hither and yon in the wilderness as you take them out to investigate water quality in the nearby stream, play a predator-prey game, or study the life cycle of monarchs? If so, you are not alone. However, many educators have tackled these fears and made such adventures seem routine. It just takes practice, and keeping in mind a few key guidelines.

## Have clear expectations

Before you walk out the door and into the wilderness — or even into the schoolyard — with your very excited and enthusiastic class, discuss behavioral expectations. This conversation can make or break your time together outside. Allowing students to help determine expectations (including the agreement to have expectations in the first place) sets up an atmosphere of mutual respect and ensures greater

understanding of the rules and a greater willingness to follow them. Make a list of a few specific behaviors and state them in the positive. For example, an expectation that there will be “no yelling and screaming” may have the same intent as “use quiet voices,” but the latter is a positive statement of the specific behavior you wish to see.

## Plan the logistics

- Have a clear signal for getting everyone’s attention and gathering together. It helps to practice it before you go outside.
- Discuss where you will gather when you get outside. If you will be on trails, establish clear meeting places such as trail intersections and trail heads.
- Explain to students that if they get separated from the group, they should sit down and wait. Someone will come and look for them.

- Decide who will lead the group as you travel down the trail. Create opportunities for children to take turns leading.
- Provide opportunities to walk and run. Let children know that this will happen.

- Use a variety of group sizes. Have students spend some time working in large groups, small groups, pairs and independently.

- To help focus attention, give specific assignments.

- Know your agenda and plans and let your students know what you are thinking while still being open to teachable moments.

- Discuss safety. If you will be near water, clearly explain the potential hazards. If you will be walking in the hot sun, make sure there is drinking water for everyone, sunscreen on exposed skin, and hats on heads. If you are using snowshoes or cross-country skis, discuss their appropriate use. Bring a first aid kit and, if someone is allergic to bees, a bee sting kit.

- Be ready for any kind of weather and dress appropriately. Bring extra mittens, hats, and boots if necessary. Rain gear and warm coats will make an enormous difference in the outcome of your outdoor activity.

- Evaluate your time together when you return indoors. Discuss what went well and what didn't. Gather suggestions for activities and behavioral expectations for future trips outside.

## Practice and model activities

Having clear assignments for students to complete when they go outdoors will help focus their attention. And whether it is a paper-and-pencil activity or an active game that illustrates an ecological concept, your expectations will be clearer to students if you practice before going outside.

Even as you head out the door, you may want to have a few practice runs at gathering together using your signal. That way, you too can enjoy the experience outside and not have to worry continually about gathering the flock.

The clearer your goals and expectations, the safer and more comfortable children will feel. This added comfort will increase their willingness to participate and complete their work.

Whenever possible, model what you want your students to do by becoming an active participant yourself. For example, if your students are drawing or writing in their journals along the trail, you should do it as well. This not only demonstrates that you value the activity; it is also an opportunity to show your students that you too are a student.

## Be flexible

No matter how wonderful a teacher you are, natural lessons outdoors will sometimes be more compelling than the task at hand. The turkey vulture soaring overhead or the rabbit running across the trail may interrupt your lesson, but accept that it is a natural attention magnet for students. Take the broader view of learning and turn these opportunities to your advantage. They are the moments your students

will likely never forget, and if you can bridge these spontaneous events to the lesson at hand, you will likely cement the learning. Your challenge is to find the bridge — and there will be one. The great thing about the natural world is that everything is connected to everything else.

## Communicate strategically

In communicating with students outdoors, be prepared to face noise, atmospheric conditions, and other distractions that you cannot control.

Take a lesson from the interpretive field and keep the following in mind:

- Make sure the sun is in your eyes; then you can be sure that it isn't in your students' eyes.

- Put the wind to your back. This will push the sound of your voice toward the students.

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*Structure your lessons to take advantage of the opportunities available while remembering the potential challenges. A trip to the pond is full of exciting learning possibilities, but there are wet shoes and clothing to think about as well.*

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Photo: Yancey Ranspot



- As you talk to students, try to reduce the distance between your mouth and their ears. Unless you are working with older students, this means kneeling down when talking. This keeps your voice from being lost in the wind, and it gives you a better perspective on what the world looks like from their view.

- If you are on a narrow trail and some students are having trouble seeing or hearing, have students form a double-file line. Stop the group, step off the trail, and walk toward the middle of the group. Have the students turn to face the side of the trail you are on, and have those in the front row kneel down. That way, everyone can see and hear without tromping off the trail.

- If you see something that you want to look at as a group (and it is appropriate to walk off the trail to it), lead the students in a single or double-file line behind you, and form a circle around it. You step into the center, and everyone can see.

- If you are on a trail you use often, place flags or markers along the way. Then if you want to allow students to travel up ahead of you, you can tell them to move at their own pace, but to stop at the next flag.

## Carry props

When you first get started, you may fear that moment of having unfocused students and not knowing how to redirect their attention. Many teachers use a prop bag in which are packed focusing games (nature bingo, scavenger hunts, recipe of a forest), natural artifacts (seeds, leaves, antlers,

fur samples, feathers), hand lenses, binoculars, and other aids. When you need to focus students' attention, pull an appropriate item out of the bag. Students usually can't wait to see what will come out next. In fact, you may find that you want to continue to use this even after you gain proficiency in taking your students outside.

## Empower yourself

Let's face it, to be a good teacher, you have to know yourself. You must have clear expectations and personal goals, and a sense of their priority so you can monitor and adjust in a heartbeat to assure that the end result is satisfactory. If indeed the best learning lies on the edge of chaos, then in order to be comfortable there, you need to be sure of your footing when you are close to that line. Just as an athlete takes time to practice on a new field before a competition, so too must teachers take time to establish a personal comfort with the new learning environment.

Prior to taking your students outside, visit the area and become familiar with it. Visualize in your mind where your students will be during different parts of the lesson and what areas you want to make sure they avoid. Structure your lessons to take advantage of the opportunities available while remembering the potential challenges. A trip to the pond is full of exciting learning possibilities, but there are wet shoes and clothing to think about as well.

The size of your group should depend on your comfort level. Some people enjoy larger groups of 20 to 25 while others prefer groups of 10 to 15. Bringing additional adults to assist with your outdoor adventure can be helpful, and

most schools have policies that require a certain ratio of children to adults. It helps to make sure the supporting adults are aware of your expectations, both of the children and of them.

Finally, remember that your level of comfort is not built by your classroom walls; it is built within your mind. If you set clear expectations, plan ahead, and follow a few key guidelines, you will eliminate most potential stumbling blocks. You will also find that your outdoor excursions will be more fun for everyone, including you. Now sleep well!

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Photo: Stewart Wilson





Photo: Allison Plute

# A Recipe for Outdoor Classroom Management

*A three-step process for preparing yourself and your students for the joys and challenges of learning outdoors*

By **Darius Kalvaitis**

**V**OYAGING INTO NATURE'S classroom can be both a delight and a wondrous adventure for children. Students enjoy and value time spent learning outside the walls of their classroom, and for many students field trips and outdoor learning experiences are the most memorable part of the school year. For teachers, on the other hand, these outdoor escapades often evoke trepidation and fear. Many of us simply feel insecure about leaving the confines of the classroom walls and the accustomed comfort that they provide. My own research has shown that "losing control" of students is the number one fear that teachers have. As a result, many teachers rarely, if ever, plan lessons out in nature.

There are effective ways to address this fear, however. Since students are excited about and yearn to take part in outdoor learning experiences, our job as teachers is to work with this enthusiasm and liveliness while at the same time maintaining a focus so that learning can be maximized. As

in any demanding educational situation, the way to master this effectively is through adequate planning, preparation and practice. Teachers who assume that students just don't know how to act appropriately outdoors are often correct, since the majority of students have not had opportunities to practice the skills they need for learning in non-classroom settings. The following three-step process is an easy-to-implement and effective means of preparing yourself and your students for the joys and challenges of learning outdoors.

1. Establish ground rules about outdoor behavior prior to leaving the classroom.
2. Practice these ground rules indoors until students are comfortable with and capable of following established protocol for working outside.
3. Take students outside for short experiences to practice the established ground rules. Increase the duration and complexity of your out-of-classroom experiences over time.



photo: Stewart Wilson

Let's look at each of these steps in more detail.

## Establishing ground rules

To create a manageable learning environment outdoors, teachers must clearly define procedures and expectations for going outside. Many students are accustomed to believing that the indoors is for learning and the outdoors is for playing. They are aware of the routines and expectations within the classroom, but assume that when the class goes outside the rules change — that they are as free to engage in unstructured play as during recess. Once students realize there are rules and that it is their responsibility to adhere to them, they will readily meet these higher expectations because of the enthusiasm that outdoor learning stimulates.

Teachers may develop their own rules and protocol for their particular group and situation. Here are some general guidelines:

- Set clear physical boundaries which students understand and cannot wander past.
- Establish a “home” location where the group gathers when summoned.
- Ensure that all students can be seen (they must be able to see you). Be aware of students' whereabouts at all times.
- Use an audible signal, such as a whistle, to get everyone's attention; and use a visible signal, such as a flag, to indicate that students should return. (When they hear the whistle, they freeze and listen; when they see the flag, they come back to the home location.)

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*Teachers who assume that students just don't know how to act appropriately outdoors are often correct.*

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- Gather students in a circle rather than in a line, so that you have everyone's attention and everyone can participate. Make sure that you are looking towards the sun so that the students can see you clearly.

- Partner students in groups of two or four (not three) who work together well.

- Set a positive tone for learning in the outdoor environment. Convey your enthusiasm and model expected behavior prior to letting the students go off on their own.
- Circulate on a regular basis as work is being done, giving positive feedback to students who are on task.
- Make sure that volunteer leaders fully understand and follow the same protocol that is practiced by the students.
- Be prepared for surprises. Just as this is a novel learning experience for your students, it is also an opportunity for you to learn.
- Use the outdoors as part of the regular curriculum, not just as an add-on at the end of a unit or a reward for good behavior or a job well done. Outdoor experiences will be more educational and meaningful if they are cumulative.

## Practicing indoors

Successful learning outdoors requires a high level of preparation, practice and support. Teachers of young children already understand the need to model appropriate behavior and then have students practice it and practice it and practice it. The best preparation for taking students outdoors is to



follow that same simple procedure. To make sure that everyone clearly understands the rules, it is best to model the expected behaviors within the confines of the classroom. It may sound silly to role-play being outdoors, yet this is a critical strategy for success. Just talking about “the rules” and “how we should behave” is not nearly as effective as having the class actually act them out. Students learn more readily by doing than by listening, and when procedures are practiced they become routine and internalized. The behavior then becomes second nature, requiring no conscious effort.

This model for teaching appropriate behavior and protocol for outdoor learning can be modified to meet the needs of most age groups. Younger students will undoubtedly require a more teacher-directed explanation and extended practice. Older students will enjoy making helpful suggestions and coming up with potential ground rules. This direct involvement gives students some personal ownership and will often lead them to monitoring their own and their peers’ behavior. Such peer monitoring can be a powerful tool in outdoor classroom management, as students support each other in adhering to ground rules and use peer conflict resolution without teacher involvement.

With my own classes, I first tell the students that I have some exciting outdoor trips planned. I let them know that I am very pleased with how they handle themselves in the classroom and believe that they can behave just as responsibly outside. I then ask for six volunteers and explain that I am going to show them rules and procedures for going outside as a class to learn.

The volunteers come to the front of the room and form a circle. The rest of the students stay in their seats as I explain the rules and have the volunteers model the appropriate behavior. I usually start with just two rules and build from there. For example:

Rule # 1: If you can’t see me, then you have gone too far and must come back.

Rule #2: When you hear this signal (whistle blow), you must stop what you are doing and look at me.

I ask if there are questions and then invite the volunteers to practice the rules. It is important to have a genuine activity for students to engage in while practicing, and I have them move about the classroom picking up litter. After a short time, I ask the volunteers, “Can everyone see me?” I then ask the rest of the class why it is important that everyone be able to see me at all times. The volunteers resume the activ-



ity, and after a short time I blow the whistle to signal them to stop moving and look at me. After the first trial, I ask for six more volunteers and we do it again with a larger group.

After a few mock exercises, we move out of the classroom to practice in the hall, cafeteria or gymnasium. Once students are successful in open indoor settings it is time to go outdoors for the real thing.

## Taking it outdoors

Outdoors, I start with a five-minute scavenger hunt (e.g., find something hard, something soft, something green, something moist), as it is engaging and educational. On our next trips, we increase the time to 10 minutes, then 20 minutes, and so on. The activities start out easy and fun (scavenger hunt or game) and move toward more demanding tasks that may include independent or group problem solving. The trick is to take it in small, manageable steps so that students feel in control at each level.

I have found that students respond to this challenge very positively because their behavior and attitude set the agenda: if they are responsible and follow the ground rules, then they will get to go outside. It is no longer the teacher who holds the reins on class behavior; it is the students themselves, who enjoy being outside and will behave appropriately in order to earn and keep that opportunity.

Going outdoors for instruction with your classes need not be intimidating. Taking the time and effort to ensure student success is one of the hallmarks of good teaching, and outdoor learning deserves the same care and attention. Preparing well for outdoor excursions will not only yield positive student behavior; it can also increase students’ involvement and participation, which are precursors to achievement. It is up to us, as teachers, to change our perception that effective learning happens only inside four walls and begin to explore the wonders of nature with our students.

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Illustrations: Tom Goldsmith

# The Caboose Hike

*And other simple techniques to enhance outdoor learning.*

By **Gloria Siers**

**A**N ESSENTIAL PART of environmental education should be the opportunity for each student, regardless of age, to experience and observe the natural world as directly as possible. Taking a group of students into the field for a nature hike or similar hands-on experience offers a chance to see the organisms and objects that have been discussed in class or studied in a text. The opportunity is exciting, but can pose several problems for the teacher. Outings usually involve entire classes, and it is a challenge to keep the attention of 25 to 30 or more students focused in a setting that is new, varied and vastly unstructured compared to a classroom setting. Trails through woodlands, fields and wetlands may be narrow, and the line becomes quite long when participants need to walk single file. It is hard to speak loudly enough to make certain that the last person in line can hear what is said. Even when the guide runs back to the middle of the line to speak to the group, it is usually necessary to shout so that all can hear the message. Yet in a forest or field setting where there is hope of seeing some wildlife, there is a need to be as quiet as possible. Even if the students can be kept silent, the guide often may frighten away much of the wildlife while trying to present facts and commentary.

*Even very young students can find out many facts about a certain plant or animal by observing where it lives, how it is shaped, its color and texture and the noises associated with it.*

Another problem that arises with a large group and narrow trails is the inability to keep students who are in the back of the group focused on the hike itself. Being farther from the guide can invite a lack of concentration and self-control. While trying to keep an eye on those at the back, the guide often has to deal with several students who compete with each other for a position at the very front of the line in order to try to keep the guide's attention focused on themselves. Both of these extremes can draw attention away from the majority of students and from the main objective of the hike – to provide an enriching outdoor experience for all. During three decades of experience as an interpretive naturalist and naturalist-guide, I have developed a few simple techniques to enhance the outdoor experience for participants of all ages.

## The Caboose Hike

The first technique is called the “caboose hike.” A long line of hikers on a narrow trail can easily be seen as a kind of “train” and of the last person in the line as the “caboose” of the train. Since speaking loudly does not guarantee that everyone in the line can hear what is said, many times the name of a particular specimen, or the explanation of a particular concept, is not heard by all. Using the “caboose



hike” method, when something of interest is found along the trail, the guide simply stops, turns to the first person in line and quietly tells that person the name of the object (flower, tree, etc.) or identifies the point of interest (deer tracks, rabbit fur caught on the end of a branch, etc.). That person, who was first in line, then steps off to the side of the trail and is instructed to repeat the information to each person, or cluster of two or three persons, who will file past as the group continues along the trail. After conveying the information to the last person in line, the speaker takes his or her place at the back of the line, and so becomes the “caboose” of the train.

With the “caboose hike” technique, all participants can be sure to hear the information and see the point of interest at close range and the line can move along smoothly. There is no need to make a great amount of noise, and no need to start and stop as would otherwise occur if the guide had to move back along the trail to a vantage point and wait for silence or attention. Every student in the group has the opportunity to be at the front of the line, to be selected to instruct fellow hikers, to rotate through the line and to be, in turn, instructed by fellow students. If the hike is well planned and the number of stops is great, each student can easily rotate through the line at least three, four, or more times during the field experience.

The basic technique of the “caboose hike” can be adapted in many ways. In situations where a greater amount of information must be passed on, or when a student is particularly shy or unable to conduct a stop alone, it is quite simple to leave two or three (but no more than three) students at one stop. Each can impart a portion of the information, or they can take turns giving the explanation. This has proven to be a very useful variation on the single-person stop, especially with groups of younger children. In cases where more difficult or complex concepts are explained, again more than one student can be assigned to the stop, or a chaperone or teacher’s aide can be given that assignment. With very large groups of 40 or more, assigning two or three students to each stop allows for a swift rotation which holds the students’ interest and ensures that everyone has several opportunities to speak. The “caboose” technique does not have to be confined to nature hikes. It can easily be adapted to a museum visit when a tour guide (other than the teacher) is not available, to a city walk where urban-dwelling plants and animals can be observed, and to other field trip environments.

Teachers and other participants in “caboose hikes” invariably comment on the value of this interactive technique. The ability to keep the attention of the participants, the chance for each person to take part in the sharing of information, and the steady pace of activity during the hike are all mentioned as being great enhancements of the learning experience. Another benefit is that since the line is always moving (except for brief moments at each stop), it is possible to cover more territory and more points of interest

in a given amount of time. The pace, amount of information, and steady movement help especially when the observers have short attention spans. Many teachers have commented that even if the students did not remember everything that was pointed out during the field trip, they easily could be expected to remember the information that they were in charge of repeating and sharing with their classmates. The technique is very simple, but extremely effective.

## The Five Tools

Another technique that has proven helpful in teaching environmental awareness, especially to elementary students

or students with little or no outdoor experience, is the “Five Tools” technique. Many urban dwellers and those living in rural-urban fringe areas, especially children, have very little background in the identification of plants and animals. Often the outdoor experience can be frustrating or intimidating because of the realization that there is so much they do not know. The question, then, is “what can we learn through observation, using tools that we already have?” Even with only a rudimentary knowledge of some of the local flora and fauna, field trip participants can find the outdoor experience to be fascinating if they are encouraged to gather information using the basic senses. Questions that crop up can later be answered using reference material in the classroom or library.

The guide may begin by asking the newly assembled group if they brought their five tools with them. Invariably students stand wide-eyed, wondering if they have forgotten to read some list of things they were supposed to bring. Most people have five tools which they always carry with them, through which they come to know their environment. Those are the five senses of sight, sound, touch, smell and taste. Even if some of the participants do not have all of these senses, it is still possible to help them focus and gather information using the tools they do have.

Using the tool of sight, students can be guided to notice colors, shapes, patterns and even things that seem out of place. For a focus on color, students could be directed to notice the vibrant plumage of a male bird or the duller colors of the female of the species. This easily leads to a discussion of camouflage and possible reasons for that kind of protection. The colors of certain blossoms, foliage, fungi, tree bark, stones and soil can be springboards for discussions about many components of ecosystems or biomes that can be observed. Notice can also be taken of the shapes of leaves, of the parts of animals’ bodies (feet, legs, wings, position of eyes), of types of body covering (scales, feathers, fur), and of the characteristic textures of the leaves, stems and bark of plant species. Such observation can help with identification or the recognition of certain adaptations that might indicate what type of organism is being observed and to which type of environment this organism is best suited.



Sound plays a very important role in helping to locate and identify a creature. Examples of this may be a bird's song, the soft rustling of dead leaves on the ground as a snake or chipmunk passes by, or the danger calls or noises made by animals who are warning that "outsiders" (the group) are nearby. It is obvious that animals have certain sounds associated with them, but so do some plants. Horsetail has silica in its stem, and makes a scratchy, gritty sound when two stems brush past each other in the wind. Wind itself sounds very different when it blows through a pine stand than when it blows through a stand of mixed deciduous trees. Since the outdoor experience can be greatly enhanced by noticing sounds, it is extremely important to impress upon the participants the need for quiet. Students will be better able to focus on listening and learning if they know that there will be group stops at appointed locations along the hike route where they can talk and make noises of their own.

The sense of touch can be very valuable in learning about organisms. Snakes are not slimy. Mullein plant leaves feel like flannel cloth. The bark of a beech tree is smooth; that of shagbark hickory is not. However, it is important to point out that the tool of touch should be used gently and wisely, with respect for the organisms or surfaces encountered. Poison ivy is an obvious example of what to avoid, as well as the picking up an injured bat or certain other creatures. Care should also be taken not to damage any plants, not to pick any flowers, and not to disturb any part of the habitat or its members.

The sense of smell can enhance the outdoor experience and give many insights as to what the environment holds. Students can be directed to notice the scent of blossoms on flowering trees in the spring; the earthy smells of mushrooms, decaying leaves and moist forest soils; the different fragrances of wildflowers or the smell of a wetland area as opposed to an open field or a pine stand. The smell of an organism can also be a key to identification, especially when it is associated with something students already know. For example, the smell of a ripe highbush cranberry has been described as rivaling dirty gym socks. The smell of the root of a sassafras sapling (root beer), can spur discussions of the origin of flavorings or spices.

Taste can be important when sampling wild strawberries or blackberries, but is probably the one sensory tool that should be used sparingly, because of the possibility of allergic reactions or exposure to poisonous substances. In discussing the sense of taste as a tool, the main focus should be on the presence of many potentially poisonous unknowns and the care that should be taken never to consume anything unless the collector is absolutely certain of the wholesomeness of the substance. This seemingly negative approach, or non-use of a tool, is an important lesson in itself, especially when it can lead to a discussion of poisonous berries, mushrooms, etc. If you would still like to make certain that the students exercise their sense of taste, it is simple enough to bring along a bag of apples

or other fruit that does not require peeling. The children can partake of a snack, there is no waste paper to discard, and the remnant of the apple core can be easily tossed into the forest or field to be food for some other creature in the food chain. It is not uncommon to come across a single apple tree growing in a meadow or a mixed stand of other trees. This can be an opportunity for students to note that perhaps some other wandering human tossed an apple core many years ago, and added another species to the diversity in the forest.

## Nature Detectives

The use of the "Five Tools" leads to the technique of having students become "Nature Detectives." The simple idea here is to encourage the observer to think like a detective: to find clues and to use them to solve the puzzle of what something is, or where it fits into an ecosystem. Students can observe and note patterns or animal signs associated with a certain habitat, evidence of systems such as the water cycle, Earth-sun relationships, weather patterns or even clouds that might predict a change in the atmosphere. Even very

young students can find out many facts about a certain plant or animal by observing where it lives, how it is shaped, its color and texture and the noises associated with it. Observers of all ages can take note of similarities between wild plants and animals and their domesticated and better-known counterparts. Foxes or coyotes can be related to family dogs, bobcats to house cats, wild grains and grasses to wheat or oats, certain types of fruits or seed pods to foods that are commonly known. This exercise can lead to discussions of the fact that many crops and domestic animals started out as wild varieties, before domestication made them part of our daily lives.

Brief lists can be made of observed organisms, the surrounding environment (habitat), and any questions that arise during the investigative activities. The students can record their comments in small notebooks that fit into a pocket, just as a real detective would have during an investigation.

After the material is gathered, names and other information can be looked up back in the classroom using reference materials.

All of these techniques can be easily adapted for hikers of all ages. They have been used with groups ranging in age from pre-school through high school and college-aged students, and with the general public up to and including senior citizens. While the techniques appear to be very simple on the surface, and they truly are simple to incorporate, the contributions they make to the field trip experience are great. They can expand and enhance the observer's understanding and knowledge of the natural environment, and do so without intimidating the novice or boring the expert.

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Illustrations: Tom Goldsmith

# Jumping Deadfall

*Overcoming barriers to implementing outdoor and environmental education.*

BY **Glenda Hanna**

**A**CROSS NORTH AMERICA, educators are confronting a “back to basics” wave designed to focus them and their students on identified learning outcomes and to reduce the time devoted to what are perceived as extraneous and frivolous experiential components and processes. As resources decline, outdoor and environmental education programs will survive only where teachers are dedicated to experiential education, where they are innovative and creative in their programming and yes, sometimes where they can be subversive enough in dealing with administrative realities.

To those who recognize the need for reform towards rather than away from experiential education, this declining philosophical and practical support is particularly frustrating. To those uninitiated in the personal and transformational powers of environmental education, the chances of overcoming the hurdles to implementing a new experiential program must seem particularly onerous. In responding to this philosophical “controversy,” Conrad eloquently illustrated the fundamental difference in advocating experiential education:

We’d be better off with less time spent with books and more time spent with nature, less time in our boxes and more time in the wilderness, with things that are real, not images, not sound bytes; to relate to and commune with flowers and streams and animals, as equals, as part of the same dimensions of being. What we need is to be free to dream and imagine and create — to create our own knowledge and discover and forge our own truth, not because nothing can be learned from books or from television, but because too much can be learned from them: the reductive truths of others that serve to define us and control us and ultimately diminish us.<sup>1</sup>

If teachers are to interpret and present the curriculum in an experiential fashion and to work to include environmental and outdoor education, they must have the knowledge and skills to overcome the barriers which may impede their way to this goal. Seven of the common barriers currently confronting outdoor and experiential education teachers are described below. Like hazards we might encounter on an outdoor trip, each can be overcome through specific strategies and tactics.

## 1. Senior administrative support



THE TEACHER interested in initiating or continuing an outdoor or environmental education program may run into deadfall: obstacles thrown in the path, purposely or

inadvertently, by administrators who do not appreciate the value of outdoor and environmental education.

Begin by knowing the administrator you are dealing with. What are his or her values and goals? What does that individual see as the mandate of the school? Start developing a proposal which addresses ways in which these factors will be covered or complemented by your program. Consider all of the positive possible outcomes of the program. These benefits may include not only cognitive, academic learning of content, but also important attitudinal, social, and physical fitness outcomes. Formal research findings as well as anecdotal evidence may help substantiate these claims. Do your homework, and use the type of data your particular administrator relates to most readily.

It is important to make strong and real curricular connections where these exist (with social studies, language arts, mathematics, physical education, etc.) and to use other teachers as support colleagues. In other words, try to integrate concepts, issues, investigations and activities across the curriculum. It may be best to begin building some of your bridges informally before going to your administrator. Important support may be secured not only from other teachers, but from board consultants, parents, students and others with an interest or commitment to this type of education.

Finally, when taking your proposal to your administrator, identify the potential barriers to success that you expect to encounter. Be prepared to share your strategies for overcoming these and to make specific requests for assistance from your administrator where appropriate. Remember, you are on the same team and have to be prepared to help each other

## 2. Teachers' comfort and competence



ONE OF the biggest barriers to getting programs going, or to expanding them to include environmental and adventure education, is the limited training, experience, and confidence of

the teachers who must deliver the program. Many are more comfortable sharing a tree poem than they are using those same trees to set up a ropes course (or vice versa). Outdoor leadership suggests a personal competence in outdoor activities, such as canoeing, cross-country skiing, and climbing, which is requisite to teaching these skills and leading others safely in the natural environment.

Your discomfort may be successfully tamed by recognizing and dealing with your real or perceived limits. If you are concerned that you do not know the proper names of all the plants or birds in your area and fear being asked a question you cannot answer, consider responding with something like, "Gee, I don't know. Let's see how many features we can identify on it and we'll look it up when we get back to class." No one knows all the answers and a co-learner

strategy more strongly reflects the collaborative approach we will need to resolve environmental issues confronting the planet. It also takes a lot of the pressure off of you, the teacher, to be perfect.

With respect to learning outdoor skills, your comfort level may be increased most readily by seeking out opportunities to learn and lead outdoor and environmental content and processes (in local, relatively safe situations before more high risk, remote locations). Developing competence may require team teaching and personal training. Because environmental and outdoor education are cross-disciplinary, you are likely to find one or more partners within the school to help complement your strengths and weaknesses. Sometimes a local college or university with an outdoor or environmental program will be able to provide one or more senior students seeking practicum experiences. While it would be unfair and perhaps unsafe to hand over too much responsibility to such a novice leader, working closely with a practicum student may pay dividends for both of you. It will be beneficial to your program in that the reduced instructor/student ratio will increase safety and educational efficacy.

Additional training opportunities are often available through board consultants, conferences, professional development events, and university courses. Many other agencies and institutions (Canadian Association of Nordic Ski Instructors, Canadian Recreational Canoeing Association, Outward Bound, NOLS, Audubon, etc.) offer leadership programs directed at helping individuals develop the skills needed to lead others in and for the outdoors. Finally, you may wish to consider joining an outdoor activity or environmental club or association and doing more personal reading to increase your experience and knowledge.

## 3. Scheduling outdoor explorations



WHILE substantial foundation work in outdoor and environmental education can be conducted indoors or on the school grounds, environmental investigations and outdoor explorations

must progress to sites with natural terrain (that is, the real world) for transformation to occur. We can learn the basic strokes and maneuvers of river canoeing on a lake, but it is only when paddling in the current and maneuvering around rocks and other obstacles that paddlers gain confidence in their skills. Traditional 30-50 minutes class periods are generally not sufficient for travel to off-campus sites and for experiential processes to be adequately developed. A minimum of a half day per week is recommended.

Many teachers express frustration at having to work after school and on weekends to get an outdoor or environmental education program going. Creative scheduling and staffing can overcome this scheduling barrier. A good place to start is with a detailed written outline of the school schedule and an understanding of the reasoning that led to it. It is important to design your course in a manner that demonstrates consistency with the primary rationale driving the school schedule or provides a very clear, articulate explanation of the reasons the current schedule does not meet the students' needs or the school's mandate.



Scheduling alternatives may involve securing sufficient administrative and collegial support to allow field trips during school time (wholly, or at least substantially). It is crucial that you work with colleagues to minimize the interruption of regular classes. Part of the answer lies in interdisciplinary programming, in which other teachers bring along their relevant content and process on out-trips. Some teachers try to minimize the impact of field trips by taking large groups of students from a few classes rather than fewer students from a large number of classes. They also work with their colleagues in drawing up a school event schedule to ensure that trips do not conflict with other planned special events.

While it is ideal to have frequent trips designed into an outdoor program, some schools do get by with only one or two during the term and a single climax out-trip of four to seven days (or even longer) at the end of the school year. A few schools have gone the opposite way, with students spending a whole semester off campus, travelling and learning interdisciplinary content.



#### 4. Terrain and sites

THE BEAUTY of experiential education, like the variety of natural sites accessible to you, lies in its diversity. It is important to choose sites which best

match your program's objectives, your experience and that of your students, and to minimize the potential for facilitating "miseducative" experiences (the excessively expensive, time wasting, or physically hazardous).

Wherever possible, students should be exposed to (mod outdoor sites near their school and home. Small local parks and ravines, and even schoolyards, often offer substantial opportunities for learning and data collection. Many outdoor skills such as pitching tents, lighting stoves, and orienteering can be taught and learned on the school grounds. Some teachers teach woodcutting and splitting, natural crafts, and other skills on site. You may wish to have your students collect materials during a field trip and then return to the school to make use of them. This approach will be more effective in helping the students appreciate where, in nature, the materials come from. With longer field periods, classes may travel to more distant wildland areas, cultural sites or outdoor centres..

#### 5. Equipment



SECURING adequate equipment, be it canoes or microscopes, is often expensive and difficult in programs with a large number of students to outfit. Yet if not enough appropriate

gear is carried, the real risk of attempting an out-trip rises beyond an acceptable level very quickly. And, of course, the variety of environments (mountains, rivers, etc.) and travel modes (cross-country skiing, canoeing, rock climbing, etc.), which can be explored and experienced will be limited by the availability of appropriate equipment. Be prepared to beg, borrow and buy the equipment needed for various program elements.

Obviously, it would be ideal if your school had its own stock of gear, and securing such is not impossible. Funds for

the purchase, repair and maintenance of outdoor equipment can be procured from the school budget (an item or two a year usually), fundraising (for example, a bake sale to earn money for sets of cross-country skis for the school), creative grantsmanship by the teacher or administrator, or the charging of user fees to the students ultimately benefitting from the equipment.

In many cases, school boards own a pool of equipment, such as a fleet of canoes and related gear, which teachers can book. This is often advantageous in that each school does not have to carry all the capital related to the gear, to face the ongoing time and supply costs to maintain and repair the gear, or the security and space concerns related to storing the equipment when it is not in use. Similarly, this is one of the great benefits of using outdoor and environmental centres. They purchase and maintain adequate stocks of good quality equipment and charge only a minimal user fee per student for rental during visits to the centre.

Finally, the teacher working in an economically depressed area needs to know that countless activities and field trips can be run with little or no equipment. In fact, lessons in voluntary simplicity taught through programs unreliant on technology may be some of the most powerful experiential messages we can deliver. A low-tech survival camping program (using tarp shelters, open fire cooking, etc.) may yield as high or even higher levels of perceived competence and a stronger relationship with the land than a high-tech program from which students leave feeling more distant from nature because of their reliance on the extensive gear (ultralight, alpine packs, tents, stoves, etc.) they carry.

#### 6. Safety and legal liability



WHEN LEADING field trips and expeditions, it is important to understand common program risks and to engage in conscientious planning and preparation of yourself and your

students. Good risk management programs include procedures for regular program implementation (theory, skills, fitness, instruction, supervision, equipment, transportation, food), as well as for rescue, first aid and other accident follow-up procedures. Some school boards have developed their own guidelines and standards for teachers conducting outdoor programs. The booklet *Safety-Oriented Guidelines for Outdoor Education Leadership and Programming* also provides information useful in helping teachers design a risk management plan for their program.

It is important to ensure that both physical and legal risks are covered by insurance. The acquisition of program leadership certifications may help by increasing your awareness of risks, by training you to deal with them safely, and by providing insurance protection to you directly in the event of an accident. Some outdoor programs may be insured through accreditation of the school itself instead of through the certification of individual instructors. Finally, some school boards subscribe to student accident insurance which pays out in the event of an accident without the injured party having to sue to secure compensation.

Take the time to learn how you would be protected in the event of an accident to yourself or your students. Generally,

while you would be named in a liability lawsuit launched against your board in the event of an accident where you were the supervising teacher, it is highly unlikely that you would be held accountable directly for damages. Take care to follow board procedures for program documentation, and use signed consent forms and waivers where appropriate to identify and share risks with students and their parents. While releases will not likely hold up against children, they may preclude their parents from successfully suing and, in the very least, will make all parties more cognizant of the real risks involved in the program

## 7. Budget



BUDGET ISSUES are indirectly the most common obstacle raised by teachers and consultants interested in environmental and outdoor education.

Teachers are advised to keep it simple and cheap, initially at least. As noted earlier, numerous concepts, skills and activities can be taught in and around the school, requiring minimal equipment and preparation.

A proposed budget should be submitted to your principal as part of the general course proposal. In it you should identify potential sources of funds to support the program costs. The response received at this level will give you a good indication of the administration's appreciation of the program. Perhaps the principal will be able to allocate sufficient funds to support all or at least part of the program. While tight school budgets may require that user fees be charged or additional fundraising be undertaken, your principal may at least be able to provide substitute teachers when you are off campus with one of your classes.

If costs are kept reasonable, and your school is not in a depressed area, students may be held personally accountable for some program fees. For example, on a day-long field trip to the zoo, it would generally not be unreasonable for students to pay their own bus fares and entrance fees. Some schools even pass on to students all or most of the fees associated with multi-day trips to outdoor centres. As some boards have rules against extra program charges to students, you should check with your principal to ensure that this is appropriate.

As a teacher, you may find yourself fundraising for your program through grant writing, direct solicitation of corporate donors, the setting up of an alumni fund, or some other creative alternative. It is important to discuss such options with the administration to secure permission and perhaps additional ideas. When fundraising from external sources, it is usually beneficial to identify a specific objective for the funds (e.g. fifteen canoes), the amount needed to achieve that objective (fifteen thousand dollars), and the date by which the funds are needed. Make sure you prepare yourself and your written materials carefully when approaching these sources for financial assistance.

Adequate funds for outdoor and environmental programs may also be raised through student activities (popcorn sales at school team home games, car washes, raffles, chocolate bar sales, and so on). These efforts not only yield program revenues, but also help teach the students about the value of their equipment or program and increase their appreciation of it. Fundraising is also typically energy intensive, requiring and fostering teamwork and cooperation, two desired outcomes of experiential education.

Overcoming barriers to outdoor and environmental education programming requires commitment, organization, and persistence on the part of teachers delivering these highly experiential programs. Yet the presence of many high quality programs in a variety of settings demonstrates that teachers are able to overcome these obstacles in a number of creative ways.

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**Glenda Hanna** is the principal researcher and author of *YouthSafe Outdoors*, in Edmonton, Alberta. Her organization provides research and training designed to enhance the safety and risk management of outdoor activities and programs involving children and youth.

### Notes

1 Conrad, D., *Proceedings of the 16th Conference of the Association of Experiential Educators*, Boulder, Colorado, 1988.

2 *Safety Oriented Guidelines for Outdoor Education Leadership and Programming*, by Glenda Hanna, was published by Canadian Association for Health, Physical Education, Recreation and Dance (CAHPERD), Ottawa, 1986.



# Field Trips: The Good, Bad and Ugly

*One of the most common mistakes made by a classroom teacher when teaching in the field is to forget to adapt the teaching techniques and structures used successfully in the classroom*



Photos: Laura Woolf Haspela

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By **Laura Woolf Haspela**

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I AWOKE IN TWISTED SHEETS, a reminder of the tossing and turning I had done throughout the night in eager anticipation of the coming day. It was the day I was taking my seventh grade class to a city park to begin a long-term field project. Since attending a teacher workshop in place-based education three months earlier, I had been crafting a way to apply the new teaching philosophy discussed – to help my students connect to the place where they live through using the environment as an integrating context for learning. I had met with an educator at the park to design a project that would be both an application of Grade 7 content standards and a means of meeting a current need of the park to enhance native habitat. It was a perfect match and I could hardly wait to get started.

Within five minutes of leaving the school parking lot, my dreams met reality: “Julia, please sit down and look forward in your seat. Justin, please keep your head inside the window — the bus driver sometimes cuts the corners pretty close,” I said, attempting to inject a bit of humor.

My reminders, unheeded, soon turned into threats. “Okay, the next person I need to ask to stay seated and face

forward will be moved. Socialize with the person sitting next to you. Julia, please move to the empty seat up front.” We were not even at the park yet, and already I was getting hoarse and feeling defeated. This was not what I had expected or hoped for.

“Welcome to Discovery Park,” read the entrance sign. We pulled into the park just as I was losing my patience. The naturalist greeted us in a bright room artfully decorated with local species of birds and mammals. She described her vision of the long-term project we were beginning: to restore a landscape that was overgrown with invasive weeds and turn it into a native plant garden. Our task that day would be to collect baseline data in our study area at the park’s periphery.

As the naturalist talked, I became angrier. The combination of a new instructor, a new classroom, and a challenging task had been interpreted by my students as an invitation to test behavior boundaries mercilessly.

I was embarrassed by their behavior and helpless to save the situation, as nothing I said or did had any lasting effect. I thought to myself, Don’t they see what a fantastic learning opportunity this is? Would they rather be stuck back at school doing assignments that have no relation to the real world? I finally asked the naturalist to cut her introduction short in the hope that getting the students out into the field would increase their level of engagement.

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*We were not even at the park yet, and already I was getting hoarse and feeling defeated. This was not what I had expected or hoped for.*

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On our walk to the study area, students' complaints of missing recess for this "stupid class" drowned out the symphony of bird songs and the rustling of the new leaves that shaded our path. At the study site, they were organized into small groups, assigned a section of the study area, and asked to record the names and numbers of each species of bird, insect, and plant they found in their plot. I quietly walked the perimeter of the study site to quiet my mind and assess students' progress. The first group I visited were throwing insects at one another. Another group had discovered that sticks can be creatively transformed into swords. As my supervisory walk continued, I spoke with each group repeatedly, encouraging them to focus on the task at hand. I modeled excitement for even the most insignificant of discoveries, hoping to elicit a bit of awe and respect for the study site. But at the end of 15 minutes I had had it. I gathered the class and we headed back to school. I had no energy for a wrap-up or assessment of the day. I felt beaten, discouraged, angry, and insecure.

What had gone wrong? After a refreshing nap and a long run, I was finally ready to face the questions I knew I needed to ask. Had I set the students up for success? Had I helped them become invested in the project? Had I remembered to take baby steps in the process of trying something new? Or had I been so attached to my agenda that I didn't see the needs of my students? It was clear that the students had not had enough prior knowledge or experience to succeed at the task assigned to them. It was equally clear that some behavioral expectations should have been established in order to reduce the mayhem.

We didn't return to the park the next week as originally scheduled. Instead, we practiced going on field trips. As a group, we brainstormed to create a list of behavioral expectations for field trips, along with consequences for not following expectations. And then we practiced. We practiced

walking respectfully as a group. We practiced listening respectfully to visitors in the classroom. We practiced treating our immediate environment with respect. We went on mini-field trips — walks in the hallway, walks around the school perimeter, and eventually a short walk to the park across the street.

One simple activity, a scavenger hunt, was planned for our journey across the street. This activity gave the students freedom within boundaries, in that the scavenger hunt list was sufficiently open-ended to encourage critical thinking and creative interpretation, and yet still held students accountable for completing a manageable task. For example, students were asked to find something that once was alive; find a resident of the park performing a life-sustaining behavior; find something natural that is turquoise, something the color of pink bubblegum, and something fire-engine red; find something dead that is larger than a football. This activity held the students' attention and encouraged them to explore the park with inquisitive eyes. The students loved it. They successfully completed the task and returned to the classroom with a list of new "cool" discoveries about a place they visit often.

Back in the classroom, students assessed their behavior according to the expectations we had created as a group, and each set one personal goal for our next journey. Then they shared with the class what they had discovered at the park. We discussed biodiversity and explored possible reasons why the biodiversity in the park was so low. We brainstormed changes that could be made to the park to increase its biodiversity. The conversation was rich and energetic, and students' ideas creative and optimistic. I encouraged them to think of ways to act on their ideas and to help implement the suggestions they were generating. After much discussion, the students proposed that we go back to Discovery Park. They decided that they could



High school students helping ornithologists collect data at a bird banding station.



Identifying a wildflower to genus and species.



Students identifying floral parts in the classroom before spending the afternoon identifying flowers in a local park.



## Helpful hints for taking learning outside

- Don't forget to apply the same good teaching techniques you use in the classroom to your work in the field.
- Give students choice and ownership over their learning.
- Provide students with the opportunity to learn through direct experience with the environment before learning about the place from an expert.
- Establish behavioral expectations for the new learning environment. Provide opportunities for students to practice and receive feedback on these expectations.



- Break tasks into manageable chunks.
- Set students up for success by modeling and providing ongoing feedback before, during, and after learning experiences.



experiment with designing a native garden at the study site and then share the results of their research with the local park across the street. I was shocked. The students were begging me to take them back to a place which they had detested only months earlier. On the other hand, it made perfect sense.

In my excitement to begin this project I had completely forgotten the basic teaching principles I apply to all assignments in the classroom. I had forgotten to set clear expectations for the new learning environment. I had neglected to scaffold my students' learning experience and to provide ample modeling. I had neglected to give them opportunities to practice new skills and receive feedback before applying those skills. I had rushed into the project before eliciting students' interest in the topic and without providing them with an opportunity to explore the relevance of the project to the "real world." (A project may take place outdoors in the real world, but that doesn't mean its relevance or value is clear to students.) Finally, I was reminded of the importance of a lesson "hook," especially for long-term projects.

These two very different outdoor trips demonstrate one of the most common mistakes made by classroom teachers when beginning to teach in the field: we often forget that the teaching techniques and structures used successfully in the classroom environment need to be adapted and applied in the field as well. In reflecting on my experiences, I realized that I had learned a number of lessons:

1. At the beginning of the school year, teachers often spend months teaching their students how to walk down the hallway and behave respectfully toward others. Similar attention needs to be devoted to teaching students how to move and interact in the field.
2. For a journey outside the classroom to be a meaningful learning experience, pre- and post-trip conversations and activities in the classroom should be designed to support and build upon the learning that takes place in the field.
3. Visiting experts (or, as in this case, park naturalists) can

make wonderful contributions to field learning experiences. Aside from imparting knowledge, they can be exceptional role models and have a profoundly positive influence on students. However, the classroom teacher still needs to direct the show, creating a learning structure that allows the guest expert to share knowledge in a way that best matches the learning goals of the teacher and the diverse physical, behavioral, and intellectual needs of the students. When classroom teachers blend their expertise in teaching with the knowledge of the field expert, learning is more easily transferred between the classroom and the field, and students are taught in a more student-centered way.

4. Outdoor settings lend themselves nicely to the use of best teaching practices such as hands-on inquiry, and teachers need to be mindful of applying such practices when crafting outdoor experiences.
5. Teaching in a new setting, and adjusting tried and true teaching techniques accordingly takes perseverance, flexibility, reflection, and courage.

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**Laura Woolf Haspela** is currently the lead teacher at Sunflower Preschool in Hood River, Oregon. She continues to enjoy mucking around outdoors with her students.

### Place-based education program

The Teton Science Schools' Outreach Journeys Program offers grant-funded teacher workshops that support practicing K–12 teachers in implementing place-based education. It includes two weekend workshops at the Teton Science Schools in Kelly, Wyoming, field teaching resources, a three-day site visit by TSS faculty and field instructors, and a year of ongoing support and facilitated communication among participants. For more information about this program and others, email [info@tetonscience.org](mailto:info@tetonscience.org) or visit [tetonscience.org](http://tetonscience.org).



Photos: Susan Snyder

# No Accident: Successful Field Trips

*Tips for non-formal and formal youth educators*

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By **Susan Snyder**

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**L**AST SPRING, I GAVE BINOCULARS to a group of third-graders, walked them toward a pond at the nature center where I teach, and let them take over. They stood at the water's edge and watched a mallard, waiting and shushing each other until it paddled into the morning sun and revealed its shimmering emerald head. The duck was a boy, the students decided. They watched him as we continued to walk slowly around the pond and took note of turtles sunning themselves on a fallen log and a muskrat skimming along the surface with a wad of grass in its mouth.

As field trips go, this one was pretty much perfect. The students had good equipment that worked, time to use it and the expectation that they would be given space to discover what was out there, rather than being forced to look only for birds, which was the topic of the trip. For classroom teachers who sign up for field trips, and the non-formal educators

who teach the trips, this is how they hope all excursions will unfold. However, as both types of educators know, great trips aren't guaranteed.

Two weeks later, I did the same activity with another group of third-graders and elicited an entirely different outcome. Students poked and pushed each other and made so much noise that any living thing that didn't have roots was long gone from the pond by the time we arrived. Several ran ahead of me on the trail, binoculars bumping and swinging from the neck straps in a manner I'd specifically prohibited.

As I sat down to record that day's trip in my journal, I wondered what had been different about the two experiences. Students on both trips were from the same grade and from similar schools, and both times we had the same field trip topic and good weather. Many teachers might chalk the difference up to the fact that some classes are simply well-behaved, while others seem bent on recreating a World Cup soccer fan riot. In examining the journal entries about these two trips, however,



I noted that although I had stated the rules for trail behavior to the second group, I had not given them clear expectations for the field trip. Nor had I attempted to create a relationship with them of any sort—I hadn't even told them my name. No wonder they treated me like some stranger who blurted out directions and lists of facts. That's who I was that day.

During my tenure as a teacher at a large nature center, I have learned that the success or failure of field trips is far less dependent on weather and the children than many of us might assume. Certainly, there are students who truly test our mettle, but they are few among the 10,000 or more who come on trips to our nature center during the school year. What matters most, it seems, are the kinds of expectations and relationships I set up as soon as the students step off the bus and walk through the doors of our education building. When classes first enter our nature center, the teachers and chaperones wait in the hallway with one of our other naturalists while our staff welcomes students into our indoor classroom and seats them. This first step is important in setting the tone for the rest of the trip. How we frame the initial experience and the rules is one of our teaching tools. We have two hours to cover whatever topic we are studying that day, so every moment with students is teaching time.

We tie our curriculum to the local core requirements for whatever grade level has come to visit, but we also have some broader objectives to fulfill. When teaching children about natural sciences, it is important to help them understand that life on this planet is dependent on cooperative relationships. Across the sciences, cooperative organisms thrive and create space for other relationships to flourish. A second-grade teacher whose class was involved in my master's research project last year said she thought such a concept might be too complicated for a seven year-old to grasp. But my research suggested that using the examples of relationships students encounter on the field trip can help lay the foundation for teaching children about relationships in nature and where they fit into them.

As I researched, I began to see the field trip rules as tools for teaching about these cooperative relationships

rather than mere lists of 'dos and don'ts' to help me control a group. Of course, I'll admit my interpretation of "focused" might look different from that of a formal classroom teacher. I recall a field trip a couple of years ago in which my group strolled the interior of the 152-acre nature center looking for tracks and other signs of animals. We examined a tree felled by a beaver and marveled that an animal that could cut down a tree with its teeth. We discussed which part of the tree the beaver enjoyed eating and noted how a beaver's front teeth are different from our own. On the way back, one boy kept stepping off the side of the trail to examine low-hanging branches of cottonwoods. And I kept reminding him to stay on the trail and focus on what we were doing. As usual, I walked backward every few minutes to make sure I still had everyone. As I turned around, I saw the boy step off trail again. This time, he placed a cottonwood branch in his mouth. His teacher was aghast, and then it hit me. "Are you trying to see what it's like to be a beaver?" I asked him. He nodded. I laughed at the folly of my mistake. I told him to take a nibble and tell us what it felt like. He did, and then stayed with us on the trail the rest of the time.

Staying focused meant something entirely different for me from that day forward. Teachers on both sides of the field trip hope the experience provides children with new concepts and new ways of framing or exploring their existing knowledge. However, when that does happen, we must allow time and space for those seeds to take root, even if it doesn't look how we think it should.

For me, it has become important to remind myself that children are ecosystems every bit as dependent on relationships and context as the pond or field we will examine together. Everything they experience and learn is connected, somehow. It's just a matter of grabbing hold of that common thread when the unexpected happens. For example, it is common for a deer or wild turkey to wander into the outdoor "classroom" that is our nature center. No normal person ignores such creatures; why would we ask children to do so on a field trip? If we are studying soil, for example—looking for its ingredients and for evidence of the decomposition that

### Tips for Happier Non-Formal Educators:

1. Be a teacher. Design curriculum that addresses core concepts students need to learn, and develop some overall teaching objectives for yourself and for students.
2. Start building a cooperative learning environment the moment students walk in your door by using rules that help you do so. Keep them short and simple.
3. Give students and the adults who come with them clear expectations of what is—and is not—going to happen. Help the chaperones help you.
4. Provide pre-visit activities to teachers. These help students better understand what to expect and help them have more fun. Connect these to core requirements so they compliment, rather than burden, the class workload.
5. Keep a teaching journal and write in it after every field trip, or at least every week. It helps you keep track of what methods work or don't work for you. It helps you teach with intention.

### Tips for Happier Formal Educators:

1. It's OK to relinquish control for a couple of hours. Trust your field trip educators. It might look like mayhem, but the children still are learning. (However, stay with your class just in case any real problems arise.)
2. If you want field trip educators to include activities that are not typically part of the field trip that's scheduled, try to discuss the request with the educators before your class arrives. Special requests are easier if they can be planned beforehand.
3. If you don't get clear direction from your field trip guide as to what you and the other adults should be doing, ask. It'll help them improve the program.
4. Do pre-visit activities with your class, if they are offered. If they aren't, maybe ask for some recommendations from the place you're going to visit.
5. It's a field trip. Vow to have fun!

creates it—seeing a deer is an opportunity to make another connection. Deer help to produce soil, both by dropping scat, and when they pass away. The idea of a sweet-faced, brown-eyed creature dying is difficult for children to accept. Still, talking about how deer and soil are related can help children understand that new life comes from death. The soil that a dying deer helps create will grow plants for new deer to eat. (Nature invented recycling long before we started collecting aluminum cans at school.)

While doing research for my master's program, I studied the ways in which I facilitate such concepts for young children. I discovered that I rely heavily on principles from indigenous philosophies, ecological teaching and learning concepts, and teacher-as-midwife components. In a 2003 article about indigenous peoples' ways of knowing and learning, Jeff Lambe wrote of a Mohawk elder who said that one way of doing so is through the *Oglala Lakota* concept of *Mitakuye Oyasin*—an expression of what it means to be a human being. "*Mitakuye* is all creation. *Oyasin* is a burning desire to know," Lambe wrote (p. 309).

As soon as our field trip students sit down, we go over our two rules: "Respect your teachers" and "Be curious." For the first rule, we discuss how teachers are not only those who hold the job title of 'teacher,' but are also all chaperones to the field trip, all non-human beings we will encounter that day (including plants) and all students who ask or try to answer a relevant question.

Providing children with this version of 'the rules' takes less time than simply listing dos and don'ts, and lays a foundation for engaging children as participants in a very basic concept of cooperation. The approach treats children as whole ecosystems themselves, by linking their need to learn with their need to be heard and to teach. This is a foundational concept for ecological teaching and learning.

"Teacher-as-midwife" principles focus on helping students draw out knowledge themselves, rather than on teachers depositing a collection of facts into students' brains for withdrawal later. (If I wanted to make deposits for a living, I'd have been a banker.) So Karen Warren (1996) resonated with me when she included these in her list of teacher-midwife principles:

- Manage logistics by providing adequate instruction time, space and equipment;
- Ensure a safe learning environment through establishment of common ground rules;
- Establish nurturing, trusting, accessible relationships with students;
- Accept the role of learner/participant in order to model desired behaviors and actions for students.

This last tenet can be easy to forget. All educators have days when we'd rather stand on the sidelines and chitchat with other teachers or parents. However, that doesn't work if we



make a deal with students at the beginning that we are all teachers and learners together. We have to get out and collect bugs, or play the hiding game, or otherwise fully engage in whatever it is that students are doing. We are modeling the exploration behaviors in which both students and adults should engage for maximum—and lifelong—learning. We have to show, rather than merely tell. Of course, there are days when it all just doesn't seem to work. And assessing what students actually glean from a short, one-visit field trip is difficult. Still, as non-formal educators we must try to find ways to measure our outcomes.

The most obvious assessment for me is student behavior. If children are pushing, arguing and jockeying for position in line, shouting at whatever wild animals we encounter and engaging in general pandemonium, they are not learning or respecting anyone, including themselves. Such behaviors are a signal that I need to change what I am doing. Maybe I skipped over something in laying out the rules and expectations, or perhaps I missed an opportunity to fully connect what I wanted them to learn with what was happening before them. If this happens, I stop, wherever I am, and go over the rules again, calmly and in a way that tries to bring them back into the atmosphere of cooperation and learning. Once I started taking this kind of responsibility, I discovered that rather than making me weary, the challenges piqued my creativity, like recognizing that a little boy was so deeply exploring the concept of a beaver's teeth that he was willing to bend the rules to do it.

I also discovered that, when debriefing conversations with coworkers immediately after a trip (a highly valuable teaching and learning tool), I wasn't using the word "control" as often as I used to. People who are collaborating and cooperating don't need "control" to make learning happen. Learning is the grand outcome of mutual respect and clear expectations.

A couple of summers ago, in the Cobscook Bay region of Downeast Maine, I met Stephanie Bailey, a Passamaquoddy First Nations woman who said, "If you can turn everything back to nature and relationships, you'll be OK." It was good advice. Whether we have students for two hours or a whole school year, the key to their success is helping them forge relationships with the material they have to learn, each other and us.

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#### Resources

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Warren, K., "The Midwife Teacher: Engaging Students in the Experiential Education Process," *Women's Voices in Experiential Education*, 182-191 (1996).



Photos: Jennifer Haynes Photography

# Nighttime Adventures

*Exploring and appreciating the mysteries of the night by leading walks after dark*

By **Brad Daniel** and **Clifford Knapp**

*"In darkness I remember that it is not knowledge to which we most deeply belong but mystery, and I sense in the mystery of night a beauty that exceeds even the great and notable beauties of the daylight world."*<sup>1</sup>

—John Daniel

**P**OETS AND NATURALISTS have raved and written about the values of darkness and the night for centuries (see sidebar for selected quotations). The beauty and magic of nighttime walking emerges in ways seldom apparent during the day. The air smells different, nighttime sounds are strange and more varied, and the trails that may be familiar in daylight appear new and mysterious in the dark. The organized night walk is a way to minimize possible dangers and increase the pleasures for participants attending camps, environmental and nature centers, or those just taking a recreational walk in the woods and fields. This article explains some of the hows and whys of planning and leading a night hike. It describes the purposes of night hikes, some potential barriers, leadership guidelines, safety tips, and suggested activities.

We have been leading night walks for many years now and we know the impact they can have on adults and children. We

know that when a night experience is conducted with care and concern for positive outcomes, the participants go away with pleasant and powerful memories and want to go again. We want participants to learn to love the night and to feel comfortable in nature after the sun goes down. We want them to discover a sense of awe and mystery for the plants and nocturnal animals. We know that these goals don't just happen—they must be facilitated with skill and knowledge of the land in a particular place. We hope that these ideas will help launch a series of night adventures for you and your students, and enable you to successfully lead others through the darkness.

## Purpose

The purpose of leading an organized night hike is to guide an experience that increases participants' appreciation for the outdoors while they learn about the nocturnal world. For example, they can discover bioluminescent organisms (perhaps foxfire fungus or firefly glow worms), animal behaviors and adaptations, how to identify star constellations, and many more wonders of the night. Although almost everyone has walked around at nighttime, relatively few have participated in a guided experience that promotes sensory awareness and mindfulness through a sequence of planned activities. Night hikes are exciting experiences for people of all ages because the outdoor darkness in natural settings is new to most.



## Potential Barriers

People often fear the unknown. For many, being outdoors at night holds negative associations. Darkness can be threatening because we are very dependent on our sense of sight; we fear what we cannot see. Also, people have been taught to fear the night by negative associations with violent acts and other threatening creatures and situations. The media have promoted these fears in our culture through horror films and tales of nocturnal evil. Ask your group what they are nervous about and you are likely to hear about Jason from the movie *Friday the 13th*. Organized night hikes seek to reduce fears by providing positive experiences leading to greater appreciation of the outdoors.

## Guidelines

We offer the following guidelines for planning and leading a night hike.

Leaders should:

1. Know the characteristics and background of the group including something about each individual's experience in the outdoors at night. Children from rural areas might respond differently than a group of kids raised in urban areas.
2. Provide an opportunity before the hike for participants to share feelings about night fears and how they were learned and perhaps overcome
3. Set the tone for the experience by helping participants understand the purpose of the hike. Participants need to feel secure in themselves, the leadership, and the natural setting in order to learn.
4. Acclimatize the group to the night by beginning with playful discovery activities.
5. Make ground rules to ensure that no one will scare others by promoting negative experiences. Reassure the group that there will be no practical jokes or horseplay during the hike! There is no place for such behavior on a night hike because it can scare people and cause accidents.
6. Explain how each activity during the hike contributes to the overall goal of learning to love the night.
7. Explain the benefits of walking quietly and slowly (i.e. to hear night sounds, see animals, and to have a relaxing time).
8. Explain how to walk safely in the dark by lifting one's feet higher than usual to avoid tripping hazards, and how people can help each other by alerting one another to tripping or eye level hazards.
9. Take time after the hike to discuss the meaning of the hike in order to help participants process the experience. A good night hike always includes time to reflect on what was learned. Sadly, it is a component that is often minimized or eliminated due to time constraints. It is better to do fewer activities and leave time to reflect on them in order to best develop a meaningful experience.
10. Inform participants that, prior to the hike, they are not to

use their flashlights in order to allow their pupils to dilate for optimal night vision (this may take about 20 minutes). There may be a few activities that require lights, however.

## Safety Tips

A variety of factors should be taken into account when planning the hike including weather forecasts, the phase of the moon and the age of the group. These factors may play a role in determining what to wear. For example, the leader might choose to wear lighter-colored clothing while leading a hike during a new moon (the phase where the moon is invisible) to increase visibility and security. If thunderstorms are predicted it is best to stay away from potential lightning strikes.

Night hike leaders need to have clearly defined safety and emergency procedures that are communicated to the group before the hike begins.

Leaders should only use trails that can accommodate the size and type of group. Avoid trails that have drop-offs, stream crossings or other potential hazards. Be sure to scout the trail beforehand and to know it well.

A minimum of two leaders is recommended for any group. A leader in the front of the group and a "sweeper" in the back ensure the most safety. Leaders at the front and back often create security and a sense of well-being within the group. A third leader is sometimes required to monitor safety in the middle of the group if the participants are inexperienced and frightened. The safety monitor should move up and down the group line watching that the group stays intact and remains on the trail. The age and experience of the participants as well as the length and terrain of the hike should be taken into account. Generally, a group of 15 or more requires three leaders. When the group stops on the trail for an activity, the leader in back should have a way to let the front leader know that the group is together before the activity begins.

It is imperative that each participant feels connected to the group. A rope line is sometimes used for younger children. The rope extends from the front leader to the back leader. The children are spaced comfortably along the rope and are instructed to hold it with one hand during the hike. For teens and adults, the group line could be established by lining up and placing a hand on the shoulder of the person in front. This method permits easy walking if the participants are lined up according to their height. A participant is told to stop walking if they become disconnected from the rope or the group. The back leader can then promptly alert the head leader to stop the hike until everyone is in line and connected to the group.

It is important that there is no conversation during the hike. This reduces any chance of confusion or distraction, which are especially hazardous at night. Also, this procedure allows the focus to be on the sounds of the night. How do you make "no talk during the walk" work? One way is to use blindfolds. When the blindfolds go on, the mouths go closed. A second way is to stop walking when anyone is talking. Yet another way is to use non-verbal signals to inform the group members of any obstacle in the trail such as a root or rock. For example, thumping the ground a couple of times with the foot mimics the behavior many animals use to alert others to danger. Because the thumping is not meant to be loud, participants must listen carefully,



The right way to walk at night."

encouraging an enhanced auditory experience. These methods can be effective and allow for a safe and educational experience.

## A Sample Plan

There are many ways to facilitate a night hike. Below, we offer a sample plan. It is important to sequence the activities so they build toward a culminating activity. The activities can be thought of in four stages: pre-hike, stationary, transition, and closing activities.

### Pre-hike activities:

The leader can prepare participants for the hike by doing some activities in the days or weeks before the actual trip. For example, students could practice identifying owls and other nocturnal animals by their sounds. Several excellent guides to wildlife sounds have been produced and are readily available (see the resource list at the end of this article).

Another example of a pre-hike activity would involve playing a simulation game such as Bat and Moth. In this game, one student is blindfolded (the bat) and one student is not (the moth). The group forms a circle around them to create a safety perimeter. The game simulates the echo location technique bats use to find their prey by sending high frequency sounds toward the prey. Every time the bat says "bat," the moth replies "moth" and the bat tries to locate and tag the moth by sound. An activity like this can be played at dusk to allow the eyes to adjust and the group to become more comfortable with being outside at dark.

## Stationary and Transition Activities during the Hike:

Stationary activities are done at places along the trail where the group stops and gathers. Transition activities are ones where the group is given an assignment while walking. Upon reaching the next station, the leader asks the participants to describe what they discovered. For example, the leader might ask the group to be aware of temperature differences when under leafy shrubs compared to under more open canopy. Upon reaching the next station, the participants would describe what they noticed and discuss how animals might use that to their advantage.

After preparing the group, the hike begins. The leader should describe how to walk in the outdoors at night (by lifting one's feet higher than usual). Many of the following activities can be either stationary or transitional depending on how they are framed.

## Station One: Sound

1. **Deer Ears.** Listen to sounds by cupping the hands behind the outer ears while standing still and rotating the upper body. The quality of sound is improved greatly by directing these "receivers" toward the source. The group can discuss how animals might use this to their advantage.
2. **Sound Inventory.** Stand perfectly still for 1-2 minutes and point in the direction of the different sounds heard. Share these with the group afterwards.

**Transition - Mental Mapping:** Ask the participants to construct a "mental map" of what the terrain is like along the length of the hike. Ask participants at each stop along the way what the terrain was like since the last station. For example, did the trail go up or down? Did it turn to the left or right? If you can spot the Big Dipper (or the Little Dipper), you can try to locate the North Star (Polaris)<sup>2</sup>. This allows participants to determine the cardinal directions (N, S, E, W) which they could incorporate into their mental trail maps (i.e. the trail turns east, etc.). Mapping the terrain can help build towards a culminating activity such as a solo hike if the group returns on the same trail.

## Station Two: Smell

**Smelly Things.** Smell the night air, soil, crushed plant parts or pass a scented marker around. Ask the group to identify the scents in the dark. Typically, you will hear a variety of answers. Sometimes, people think they are identifying things by smell alone when it is actually the combination of sight and smell being used. Removing the sight component often makes it more difficult to identify a smell.

**Transition:** Touch and Go. Along a safe section of the trail, ask the group to focus on feeling the trail with their feet. Then, ask them to step off the trail to one side (watch out for poison ivy or other hazards) and then back on the trail. Have them do this several times and then report any differences. Trails tend to be more compact and quieter whereas "off trail" is often softer and louder due to twigs, leaves, and other debris.

## Station Three: Sight

1. **Night Light.** Look to the left or right of a distant star or planet to use the rod cells in your retinas to see faint light and contrast better. Try this by looking at objects on the trail. The rod cells in your eye help you see contrast. The next activity illustrates this.
2. **Headless Horseman.** Pair up the group members across from one another and have them stare at their partner's head without moving their eyes. Have them describe what happens when they do this. (Their partner's head should seem to 'disappear.' This only works in very low light.)  
**Explanation:** The retina of the eye contains rods cells, which detect light contrast and cone cells, which detect color. Due to the placement of the rod cells, they are activated more by viewing peripherally rather than using direct focal vision. Therefore, looking to the left or right of a head or star enables the shape to be distinguished more clearly. Staring directly at the head does not activate the rod cells in the same manner, causing the head to seem to disappear.

**3. Color in the Night.** Distribute small pieces of differently colored paper or colored toothpicks to the group members. Ask them to guess what color(s) they have. Ask them to identify different colors of clothing. They can check their accuracy when they return to a lighted area. Cone cells allow the eye to detect color providing there is enough reflected light to see the object. When light is diminished, it is much harder to discern color.

**4. After Image.** Discuss original and reflected light sources (reflectors, matches, stars, planets, moons, electric lights, etc.). Then predict how much light will be cast from a single match, and light it from a distance away. Move the lighted match in a circular or linear pattern. Ask the people to quickly close their eyes to try to see an after image of the pattern. Next try this with a flashlight to compare what happens. The image created after the brain translated the light received via the optic nerve remains briefly after the source disappears.

**Transition - Thermometer.** Check the temperature of the air, trees.

#### Station Four: Night Vision and Solo Time

- 1. Night Sight Story.** Tell a story about exploring the outdoors at night while participants close/cover one eye. Have the participants stare at a lit candle or bright lantern with the open eye during the story. Extinguish the light and have participants look around with each eye to see if they notice a difference between the one that was covered/uncovered. The difference is dramatic because the light causes the uncovered pupil to contract while the covered pupil remains dilated.
- 2. Night Eyes.** After the story, ask the group to describe how night vision develops (pupil dilates to allow more light in). The story can serve a dual purpose. In addition to creating a dramatic difference in night vision, it can help create a metaphor for use in the solo hike described below. Explain this metaphor by giving an example.
- 3. Solo Hike/Sit.** Place people along the trail so they can experience the night alone. Tell them not to move and communicate with other people. Pick them up again after a short time. Another option (not for young children) is to have them do a solo hike alone back to where the hike started. You can send them out at longer or shorter intervals depending on the amount of ambient light, and other factors. Always allow those that do not want to do a solo hike to bring up the rear quietly. Remind the solo hikers to use what they have learned on the night hike up to that point.



To simulate echo location, a group plays "Bat and Moth".

#### Station Five: Taste

- 1. Sparky Party.** After returning from the solo hike, have a "sparky party" to celebrate. In pairs facing one another, instruct the group to chew wintergreen (WintOGreen) Lifesavers with an open mouth (trying not to wet the lifesaver with saliva because it flashes better when dry) while observing the mouth of their partner. Ask them what they think creates a blue-green glow when broken by the teeth or a pair of pliers (to save fragile teeth). This phenomenon, called triboluminescence, occurs when light is released in the visible spectrum after the chemical bonds of the granulated sugar molecules in the presence of wintergreen oil (methyl salicylate) nitrogen in the air are broken. Try scraping rock candy with a knife in the dark to see a glow. (Unless the candy is damp, it usually works.)

#### Closing Reflection Activities

Take time to reflect on the night hike experience.

1. Make a list of open-ended questions for the participants to complete verbally. This will help them reflect upon their night walk experience. Once the group is back together, have them form a circle and share a few of these. Some examples: What is one thing that you appreciated most about the walk? What new facts did you learn about the night? Did you have any surprises along the way?
2. Ask the participants to finish the following sentence stems:
  - a. The best thing along the way was . . .
  - b. Now I realize that darkness is . . .
  - c. One thing I'm still wondering is . . .



3. Have the participants say one word that best describes how they feel about the night after the walk.
4. Ask the participants to make up a round robin story about the night by saying a few sentences and then having the others, in turn, continue the story thread from where the last person ends. (Make a rule that the story cannot be a scary one because the purpose of the walk was to learn to love the night, not be afraid of it.)
5. As a final closing, you may choose to read one or two of the quotations included in this article. You can also find short poems about the night to read to the participants.

## Conclusion

If the leaders follow some of these suggestions and participants were cooperative and open to trying something new, chances are that the night walk will be a positive experience. Keep in mind that one evening outside cannot completely change a lifetime of fears and negative associations with the dark. We often feel safer in the forest at night than we do in the city. It takes a gradual progression of non-threatening associations with the beauties and wonders of the night in order to learn to love it. We suggest that the initial experiences with the night be kept short and pleasant. Each successive night can be longer and introduce new activities. Additional activities, useful equipment and resources, and selected quotations about the night can be found at the end of this article. We wish you peaceful ramblings as you and those you lead become closer friends with the night.

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### Notes

1. Daniel, J., "In praise of darkness", in P. Bogard, ed., *Let There Be Night: Testimony on Behalf of the Dark*, University of Nevada Press, 2008, p. 30.
2. A useful guide to explaining how to do this can be found at: <http://www.physics.ucla.edu/~huffman/finddip.html>.

### Resources

- Altieri, T., "The Magic of Night Hikes", *Green Teacher* 58, Summer 1999, pp. 30-32.
- Baker, R., Chartrand, M., Gordon, J., and Zim, H., *Stars (Golden Guide)*, St. Martin's Press, 2001.
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- Chartrand, M. and Wimmer, H., *Night Sky: A Guide to Field Identification*, St. Martin's Press, 2001.
- Lang, E., *A Guide to Night Sounds: The Nighttime Sounds of 60 Mammals, Birds, Amphibians, and Insects*, Stackpole, 2004.
- Lawlor, E.P., *Discover Nature at Sundown*, Stackpole, 1995.
- Rey, H.A., *The Stars*, HMH Books, 2008.

### Equipment

Colored cards or paper, candle, lighter or matches, Starfinders, pieces of Quartz (rock), birdsong identifier or small tape recorder, blindfold, rope, flashlight with red lens or red covering of cellophane or red balloon (red light is less disruptive of animals), scented markers or film canisters filled with essential oils like mint orange, etc., Wintergreen Lifesavers

## Additional Activities, Equipment, and Resources

There are many other popular activities to do on a night hike. These include:

1. Nocturnal Menagerie. Locate animals such as frogs, toads, earthworms, spiders, bats, and owls. Discuss the definition of a nocturnal animal. Try to estimate the size of an animal based on its sound. As the sense of hearing becomes more acute, participants will often overestimate the size of animals making noises. Have the group listen to recorded night sounds before going outside.
2. Rock On. Strike or scratch quartz rocks together sharply. They will give off a flash of light and a faint smell. This happens because striking them causes the alignment of the crystalline molecules of the quartz to be interrupted, and an electric discharge results when they realign (an example of 'piezoelectricity'). The faint smell of sulfur is caused by a chemical reaction in the sulfur compounds in the rocks.
3. Latitude. In the Northern hemisphere, find the North Star (Polaris) and put a stick in the ground pointing directly to it. This stick forms an angle with the flat ground which is equal to the latitude of the location. It can be used on a sunny day as a sundial gnomon.
4. Night Owl. Play a recording of a common owl call or imitate it with your voice. An owl may respond to the call if the group is quiet. Do not over do this during nesting season because it will disrupt the mating habits of the owls.
5. Bioluminescence. Search for bioluminescence in fireflies, glow-worms (firefly larvae), decaying wood (containing foxfire fungi), and other natural objects. Find out what causes each form of light. To find foxfire more easily at night, walk the path in late afternoon and kick some of the decaying wood to expose the bioluminescent fungi in the wood.
6. Spider Eyes. Using a flashlight, search for the reflection of spiders' eyes by holding the base of the light on your forehead and projecting the beam into the vegetation where spiders hide.
7. Legend of the Stars. On a starry night, invent new symbols, shapes, and stories in the sky to correspond to the different star patterns. Then learn the traditional star patterns identified by different cultures, including your own.
8. Insect ID. Hang a white sheet outside and shine flashlights on it to attract night-flying insects. Try to identify them.
9. What's up DOC? Determine if the moon is waxing or waning, by looking at the side with the more pronounced curve. Think about the word DOC. D=Waxing (becoming more illuminated each night, represented by "D" because when waxing the left side of the moon is dark), O=Full (fully illuminated), C=Waning (becoming less illuminated each night, represented by "C" because when waning the right side of the moon is dark). Note: in the Southern Hemisphere, this mnemonic is reversed—"COD."

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