

# The Great Outdoors

*Ms. Lee's class walks in pairs the few blocks to Emerald Park. Mark in his wheelchair and his partner Kris lead the double line of 22 other exuberant third graders. Each student has a clipboard, pencil, and a notebook containing observations and measurements made during their fall and winter visits. Around each student's neck is a string with a hand lens and a 15 cm ruler. Each pair of students also has 4 m of string and 4 ice-cream sticks. Ms. Lee's student teacher, Mark's aide, and five parents accompany them.*

*The students look for the observation areas that each pair picked out during the first visit last fall. Gerri and Sanjay wonder if they have found the correct location. The 1 m tall bush that was in the middle of their plot is no longer there. So they check their maps. Upon closer examination, they find a small sawed-off stump where the bush used to be. Their adventure yields lessons in science, time, and safety.*

## The Limits of Your Classroom

Your own classroom is rich with resources and activities, but there are some things that simply can't be done there. Sometimes you have to go elsewhere to collect real-life data—an exhibit, some equipment, or some experience that cannot be duplicated in your school. Well-planned field trips are a vital part of the total educational program. They play an important role in helping students relate basic concepts learned in the classroom to practical work and applications in the real world. But in today's tight-budget, cost-cutting era, you need to take more time to ensure that the few resources available to support off-campus activities are used effectively. The purpose and goals of the trip need to be integrated with the learning expectations of your program. And just as importantly, the activity needs to be planned well ahead of time to ensure a safe and productive experience.

Because you will be working outside the confines of your classroom, in addition to the safety issues you would normally encounter in planning for science activities,

you now need to account for the fact that the venue may be larger, less familiar, and there likely will be more excitement surrounding the activity.

## SOME THINGS TO CHECK

- ▶ What are the natural boundaries of the site?
- ▶ Are there hazards within the boundaries of the site?
- ▶ Are there hazards accessible from the site?
- ▶ Is there any toxic vegetation?
- ▶ What is the likelihood of insect hazards (e.g., deer ticks, mosquitoes, bees, spiders)?
- ▶ Are animal encounters likely?
- ▶ What are the tripping or falling hazards?
- ▶ Can you see and monitor all students at all times?
- ▶ Are there private property/trespass issues?
- ▶ Is there a chance of the presence/intrusion of other groups or individuals?
- ▶ What are the conservation restrictions?
- ▶ How much Sun exposure are students likely to get?
- ▶ Are there water hazards?
- ▶ Where are the rest room and washing facilities?
- ▶ What is the nearest emergency medical facility?
- ▶ What is the nearest source of help?
- ▶ Where is the nearest phone?

9

### Low Cost—No Cost

Consider making your first field study one that can be done just outside your building. This way, you can test the maturity of your students and their ability to respond to your instructions in a more open environment. You can begin training helpers to assist with monitoring the students' work and ensuring their safety in a less formal setting than your classroom.

Regardless of the location of your school, there are opportunities for field studies right outside the school building—on school grounds or very close by. A strong investigative science program depends on providing students with the opportunity to collect and analyze data. For young children, this can be as simple as counting the number of vehicles or people that pass by or observing the size and shape of shadows cast by a building or piece of equipment on school grounds. The simpler the task, the better.

When you choose a simple phenomenon to observe, it is easier to find and limit the number of variables that need to be controlled in the observations (e.g., time of day, location, measuring instrument, and technique for measuring). And by beginning with a simple field activity in a nearby, familiar location, you can also more easily observe and identify possible safety hazards.

## Scout It Out and Be Prepared

As part of your lesson planning, you must thoroughly examine the site. If at all possible, every person who will be accompanying you and your students should also preview the site. Your checklist of things to do at the site should include surveying the site for possible safety hazards.

If you expect to use staff or consultants from the field site, then a full and detailed planning session should include a discussion of exactly how you will prepare your students, what you expect your partner/consultants to do with your students, and enough information about your group and individual students for the “outsider” to know what to expect and how to work safely and effectively with your class.

You must determine clearly and exactly who will be in charge of each and every student at every moment of the out-of-class activity. The greatest potential for problems arises when one adult assumes that another adult is responsible for a child or group without being certain that the other adult is in place and has explicitly recognized and accepted the responsibility.

As discussed in Chapter 1, always keep in mind that you are responsible for everything that is done with your class at all times. That is key to recognizing the steps you need to take in preparing for a field trip. Even though there are extra adults, remember it is also your responsibility to thoroughly prepare your assistants for their duties.

Do not invite or accept any other person’s assistance in your class and with your students unless you have personally reviewed the entire plan, purpose, and procedure for the activity. A few quick comments five minutes before the activity begins are not enough. Remember, most parents have not supervised more than a half dozen young children at any one time. What you do every day out of habit is not necessarily second nature or inherently obvious to even the most responsible parent, student teacher, or aide. Think of the many things that you have learned the hard way and make sure

your volunteers do not do the same! And if you do use parents as chaperones, be sure that they do not bring younger siblings or any other guests along.

## HOW MANY IS ENOUGH?

There is no clear ratio of adults to students that can be applied to fieldwork. The right number depends on such disparate factors as the distance and location of the site, the hazards at the site, the nature of the activities you have planned, the skill and experience of the chaperones, and the behavior of the students in your class. However, here are some guidelines to help:

- ▶ Do not count yourself in the adult/student ratio or assign yourself to a specific group—you need to be available to monitor the overall activity and support your helpers.
- ▶ Special education aides should not be counted in the adult/student ratio. In groups with special education students, the aide(s) should be in addition to the sub-group chaperone.
- ▶ Every child in a chaperone's group should be clearly visible and reachable by the chaperone at all times.
- ▶ Include enough adults to allow one or more adults to go for help or stay with an injured student while still having enough adults to properly supervise the remaining students.
- ▶ Make sure you conform to any adult/student policies required by school authorities.

## How Are You Going to Get There?

The buddy system is a must for any off-site activity. Even if you are asking students to work in small groups, it is critical that every student be specifically paired with one other student who must always be aware of what is happening to the buddy. It is just too easy for even a group of three or four to get so engaged in some task or discovery that one missing member might not be noticed immediately. Make sure that all students know who their buddies are, who else is in their group, and which chaperone has been assigned to their group.

Walking may be the best and most convenient way of reaching an outdoor site. It gives you the greatest flexibility and the lowest cost. Be sure you review crossing and waiting rules, especially if you are anywhere near roadways, driveways, bike paths, or other hazardous crossings. You will need an adult at the beginning and at the end of the group. As a general rule, put your slowest walkers at the front and the quickest at the back. The slowest walkers should set the pace.

Public transportation (buses, trains, trams, trolleys, subways, ferries) may be available to you. If so, this may be an economical option, as well as an opportunity to teach your students how to use public transportation safely and responsibly. If you use public transportation, remember that it may be more difficult to get a group on and off the vehicle during scheduled stops than if you were traveling alone. So make sure you review the embarkation and disembarkation instructions carefully with students and chaperones. You do not want an individual or equipment left behind on a vehicle or a platform.

A school bus or chartered bus is the most common method of transporting students to and from field sites. To ensure you get to the correct place at the right time and return as expected, you need to supply written plans and instructions that include:

- ▶ Number of adults, number of students
- ▶ School pick-up time
- ▶ Destination and drop-off location at the trip site
- ▶ Field site departure time
- ▶ School return time and pick-up location

Whether you travel on foot, or by public or private transportation, when you are off site, you and your students will most likely come into contact with people whom you don't know. It is imperative to discuss ahead of time appropriate and inappropriate interactions with "strangers." Your students must know that courteous behavior is expected but that they need to limit their conversation and contact.

## A Meeting Place

Establish a specific meeting place and make that place the very first stop with all your students and chaperones.

Make sure that everyone knows when and under what circumstances to stop the activity and report immediately to the meeting place.

## Accounting for Everyone

Check the total number of students and adults

- ▶ before leaving the classroom
- ▶ when beginning walking or during boarding of vehicle
- ▶ at least once per hour at the site
- ▶ prior to moving from one site to another
- ▶ upon arrival at each new location
- ▶ at every boarding of vehicle
- ▶ prior to departure
- ▶ upon return to school

They should never divulge personal information, accept any items, permit personal contact, or become separated from the group and assigned chaperone. Instruct students to immediately report to you or their designated chaperone if they experience any unwanted, unusual, or uncomfortable contact from anyone, including authority figures and persons in charge of the site you are visiting.

## Museums, Zoos, Outdoor Education Centers, and Other Institutions and Establishments

Young children are often taken on field trips to science museums, children's museums, discovery centers, zoos, and the like (also known as informal education resources). The most productive and the safest of such visits are those with a planned and narrowly focused purpose that has been carefully discussed in advance with the educational staff of the institution to be visited.

Preparatory classroom work before the visit is also important. The greatest potential for disappointment and trouble arises when the visits are general tours, or when the teacher simply turns students over to the institution staff. Without a specific series of tasks to complete, questions to answer at the site, and objectives that are an integral part of your school program, students are easily tempted to race through the site, hide or get lost, cause disturbances, harm exhibits, and hurt themselves.

With a clear focus, they are much less likely to amuse themselves in unproductive or dangerous ways. Your presence and active participation with the institution's instructors are also imperative to ensure that students understand that the activity is very much a part of the ongoing educational plan. You are the one who knows your students best and you are responsible for knowing exactly what they have been taught and what they have experienced, even if you are not the lead instructor.

## Outdoor Sites

Whether the site is as near as just outside the school doors or far enough away to require a bus or even an overnight stay, you need to check out the possible hidden hazards, especially if you are using an unfamiliar location. You should also make sure that the site does not carry restrictions for use and access (e.g., conservation land, wildlife preserve, private property, hazardous materials contamination).

### *We Have Met the Enemy and They Are Us*

If there is a building or structure (e.g., bridge or tower) near your chosen site, you should find out if there have been refurbishing projects that could have taken lead paint off the structure and allowed lead dust to contaminate the area. If utilities have

right-of-ways in or near a site, you need to be certain that high-voltage hazards are not close by. Do not count on students to read and obey “Danger, Keep Out” signs. Sites near utilities and manufacturing and research facilities should be checked for the possibility of toxic wastes. Areas formerly used for military training may contain unspent munitions.

### *Water, Water Everywhere*

Water bodies present a number of hazards that need to be checked and carefully avoided. Remember that young children can drown in water less than 15 cm (6 in) deep. What is the footing like near the water’s edge? Is the water biologically or chemically contaminated? If students are going out onto a body of water such as a lake, pond, or the ocean, you need to ensure that everyone knows the water safety rules and that you have met all the rules and regulations. Regulation life preservers should be on and not just available. Is a person trained in water rescue available? Are you and others trained in cardiopulmonary resuscitation (CPR)?

### *Our House Is a Very Very Very Fine House*

In the outdoors, it is likely that you will be intruding on the homes of large and small wild organisms. Remember, these are their homes: you and your class are the aliens. You need to be aware of insects that are indigenous to the area and whether they could carry infectious human disease (e.g., Lyme disease, encephalitis, yellow fever). Check with your district medical services if you have any questions or doubts. If you plan to use insect repellent, make sure that you check with the district medical authority as to the potential toxicity of repellents that contain DEET. Determine whether anyone on the trip has allergies to bee stings or other insect bites and what you are required to do about it.

What other animals are likely to be found at or near your site? What is the normal behavior of these animals? What are signs that the animal may be sick or injured? You do not have to be the expert on this, but you do need to check with a naturalist or guide who is familiar with the location and can advise you thoroughly and accurately. As a rule, the normal behavior of animals is to hide or run from humans. One that approaches your group or does not scurry away is more likely to be sick or injured and should be left alone and avoided. Warn children not to feed them or try to corner

## Planning to Use Public Transportation

- ▶ Check schedules
- ▶ Contact the transportation authority to be sure they can accommodate your group with their regularly scheduled runs
- ▶ Review procedures and expectations with chaperones and students
  - ▶ Who will pay the fares
  - ▶ Where you expect to get on and off
  - ▶ What to do if someone gets separated from the group
  - ▶ Courtesy and consideration
  - ▶ Interaction with strangers

them. Be especially cautious of animals that may be nesting or nurturing young. An animal protecting its young is likely to be very aggressive. Above all, do not touch or approach a sick or injured animal—do not attempt a rescue or try to bring it back to your classroom.

### *Parsley, Sage, Rosemary, and Thyme*

Vegetation in an outdoor area can also pose hazards. To begin with, nothing should be tasted or eaten. Some exceptions may be appropriate if you are working with a facility formally developed for outdoor education and with specific “wild” specimens deliberately cultivated or identified for a tasting activity. But even professional botanists will tell you that species can be confusing. Very few will *ever* eat a mushroom taken from the wild.

Pollen and spores may cause allergic responses. Be sure to check for allergic sensitivities among your students and assistants. If you have sensitive students, you may want to avoid outdoor activities altogether when pollen counts are high.

Plants can also cause serious irritation on contact. The best known are members of the *Rhus* family, commonly called poison ivy, poison oak, poison sumac, and poison elder. These plants are widespread in outdoor areas and may have different appearances in different habitats and seasons. Learn how to identify them and teach your chaperones and students to do the same. (See **Plants** illustration in Chapter 5.)

Some people mistakenly believe that they are immune to the irritants in these plants because they have come into contact with poison ivy or its relatives without developing the classic itching and blistering response. In fact, sensitivity to the antigens can develop as a result of a series of exposures, with each subsequent contact resulting in stronger response.

The saps of many plants are serious irritants, particularly milky-looking saps. Children should be taught to avoid touching plants they are unfamiliar with and to wash off thoroughly following accidental contact. Be sure to warn against rubbing of eyes that may transfer substances from the hands to the eyes.

If a campfire or something similar is planned, be sure you know the contents of the wood and twigs being burned. Burning such things as oleanders and *Rhus* create highly toxic fumes.

### *The Sun Also Rises*

We now know there is reason for serious concern about skin damage caused by Sun exposure. Excessive Sun exposure when young can greatly increase the risk of skin cancers many years later. Therefore hats, long-sleeved clothing, and sunblock are necessary precautions for everyone working in the outdoors. Be sure lips and ears are also protected. Heat and dehydration

#### SPF

The potency of sunscreens and blocks is measured by their Sun protective factor (SPF). Sunscreens with SPFs between 15 and 30 will block most harmful ultraviolet (UV) radiation, according to the National Cancer Institute.

are factors to be considered. Make sure the work area does not get too hot (or too cold) and that everyone remembers to drink plenty of fluids.

## LIGHTNING STRIKES

Lightning is a form of electricity with extremely high voltage, produced by charges in the upper atmosphere. Lightning strikes somewhere on Earth 100 times each second, and each year about 1000 persons are killed by it. Many more persons are hurt.

Because lightning finds the best *conductor* to reach the ground, it is more likely to hit a standing human being than the flat ground around him or her.

If you can see lightning or hear thunder you are at risk: Seek shelter in a large building or an enclosed vehicle. Never stand under a tree or near a tall, projecting structure that might provide a *conducting* path for the lightning bolt to reach the ground.

Learn more about lightning hazards at: [www.azstarnet.com/anubis/zaphome.htm](http://www.azstarnet.com/anubis/zaphome.htm)

### *What's the Weather?*

You may not be able to control the weather but you better make sure you're prepared for it. Know what the variations in temperature and weather can be at the site you choose. What are the risks of sudden storms or flooding? Make sure you know and make sure you have a shelter and evacuation plan.

Once you have obtained the information you need to fully understand the site and its potential hazards, you need to plan training for your chaperones and lessons for your students. These lessons should alert students to the hazards and give explicit instructions on how to avoid problems. These should begin before the trip and then be reviewed and enhanced at the site as closely as possible to when and where the hazard is likely to arise.

### Equipment and Supplies

When planning for an outdoor activity, you need to think about two categories of equipment and supplies:

- ▶ Items needed to complete the planned activities
- ▶ Items needed to keep the group safe

You also need to make sure that equipment used outdoors is sturdier and

## Special Needs

Special needs students can and should be included in all planned field activities.

Many outdoor facilities are now equipped with ramps for wheelchair access, braille trail signs for the sight impaired, and other modifications to promote accessibility. In some cases, teachers and students helped design and prepare these accommodations.

Bring emergency medical information along on all field trips. Include an EpiPen and person trained to use it as appropriate.

less breakable than what you might use in the more controlled environment of your regular classroom. Try to avoid anything made of glass and anything that is fragile or brittle (e.g., use plastic sampling containers rather than glass, metal probes rather than glass, plastic hand lenses and water magnifiers rather than regular microscopes).

Weight and bulk should also be considered. Make student pairs or groups responsible for carrying and accounting for specific items, and then make sure that the materials are packed for safe transport and are light enough for the students to handle easily. Plan sufficient time for equipment to be returned, counted, and repacked before leaving the field site.

Dress and footwear should not be left to chance or imagination. Make sure you provide students and parents with a clear list of appropriate clothing and shoes for the outdoor adventure. Dressing in layers is a useful strategy. It allows for adjustments to be made at the site. Hats are useful in both hot and cold

situations. In sunny weather, they provide shade; in cold weather, they protect from loss of body heat. Shoes need to provide good support for the arches and ankles and have nonslip soles. Open-toed shoes, sandals, thongs, and slipper-style are inappropriate for fieldwork. Extra toe protection and waterproofing is also a plus.

What to include in your first aid kit depend upon the hazards of the site. Plan your first aid kit item by item rather than generically. Make sure that you have sufficient drinking water or other beverages for the duration of the trip. As a consequence, you also need to plan for the availability of rest rooms.

## Permissions

Your district or school may have a standard form permission slip. If so, you should begin with that document. However, because science field trips may entail more complexity than other field trips, make sure you include additional information that alerts parents to the nature of the activities planned and the special preparation that might have to be made (e.g., clothing requirements). Request, too, that parents make you aware of special needs that their children may have (e.g., allergies) even if they have already done so previously.

Your permission slip cannot relieve you or the school of liability for student safety. But it is an important legal document to show that you were well organized and had planned carefully.

## SAMPLE HEALTH INFORMATION FORM

*Source: The Brookline Public Schools, Mass.*

### ***For overnight, out-of-state, and out-of country field trips***

Child's name \_\_\_\_\_ Date of Birth \_\_\_\_\_

Address \_\_\_\_\_ Telephone # \_\_\_\_\_

### **Parents/Guardians**

Name \_\_\_\_\_ Work Phone # \_\_\_\_\_

Name \_\_\_\_\_ Work Phone # \_\_\_\_\_

Family Doctor \_\_\_\_\_ Telephone # \_\_\_\_\_

### **Emergency Contact Person** (If parents/guardians not available)

Name \_\_\_\_\_ Phone # \_\_\_\_\_

Address \_\_\_\_\_ Work Phone # \_\_\_\_\_

## HEALTH INFORMATION

1. Is there a PEANUT, BEE STING, or INSECT allergy? \_\_\_ If yes, treatment \_\_\_\_\_

Any other allergies (food, aspirin, etc.)? \_\_\_ What? \_\_\_ if yes, treatment \_\_\_\_\_

2. Does your child have any medical condition? \_\_\_ If yes, state diagnosis, treatment, medication

3. Has your child been exposed to any communicable diseases within the past 21 days? \_\_\_ If yes, specify \_\_\_\_\_

4. Is there any factor that makes it advisable for your child to follow a limited program of physical activity, i.e., heart, recent fracture or surgery, asthma, abnormal fear? \_\_\_ If yes, specify in which ways you wish his/her program limited.

5. To protect your child from any possible embarrassment, does he/she wet at night? \_\_\_ sleep walk \_\_\_?

6. Please list date of the most recent tetanus shot \_\_\_\_\_

7. Is your child bringing medication, including over-the-counter and prescription? \_\_\_ If yes, complete the Medication Administration Form on the reverse side.

**\*Medications MUST be properly labeled in their original containers.**

Parents/guardians will be contacted in case of serious sickness or accident. However, in the event of an emergency situation that requires immediate medical attention I, the parent (guardian), hereby give permission to the physician selected by the director of the trip leader in charge to hospitalize, secure proper treatment for, and to order injection, anesthesia, or surgery for my child as named above.

Signed: \_\_\_\_\_ Relationship: \_\_\_\_\_ Date: \_\_\_\_\_

### SAMPLE MEDICATION ADMINISTRATION FORM

Each medication (including vitamins and supplements) must have a separate listing and complete instructions or the medication cannot be administered.

Child's name \_\_\_\_\_

1. (Medication) \_\_\_\_\_

(Dosage/How much) \_\_\_\_\_ (Frequency/How often) \_\_\_\_\_

(Diagnosis/Symptoms/What is this being administered for?) \_\_\_\_\_

2. (Medication) \_\_\_\_\_

(Dosage/How much) \_\_\_\_\_ (Frequency/How often) \_\_\_\_\_

(Diagnosis/Symptoms/What is this being administered for?) \_\_\_\_\_

3. (Medication) \_\_\_\_\_

(Dosage/How much) \_\_\_\_\_ (Frequency/How often) \_\_\_\_\_

(Diagnosis/Symptoms/What is this being administered for?) \_\_\_\_\_

YES NO

\_\_\_\_\_ My child may be given Tylenol.

\_\_\_\_\_ My child may be given Benadryl.

\_\_\_\_\_ My child may use insect repellent.

\_\_\_\_\_ My child may use sunscreen.

Prescribed medication **must** be in a prescription bottle with a pharmacy label containing the child's name, the name of the medication, the dosage, and directions for administration. All nonprescription medication must be in the **original** container with directions for use, labeled with the child's name, and with a licensed prescriber's note.

Signed: \_\_\_\_\_ Relationship: \_\_\_\_\_ Date: \_\_\_\_\_

## Take Nothing but Pictures, Leave Nothing but Footprints

If you concentrate on activities that are aimed at collecting data rather than specimens at field sites, you protect yourself as well as the environment. Before planning an activity that results in removing something from or irreversibly disturbing the field-study area, ask yourself if there is any reasonable way you could accomplish the same educational goals in another way. Science is more about observing than about collecting, so the less intervention with the observed system the better. If you and your students can observe without touching, so much the better. Let the hands be on the instruments rather than on the organisms. That way you minimize the hazards that unknown or unanticipated organisms can pose and you make the least number of changes in the ecosystem you visit. You minimize contacts with potential allergens or infectious agents and you avoid the inadvertent removal or harming of protected species.

On the other hand, plan on carrying out everything you bring into the field site including used materials, leftover supplies, and trash. Be aware that each outdoor environment has its own, perhaps unique, delicately balanced ecosystem. For that reason, you should not simply release classroom-raised organisms to the outdoors. They may be completely alien species, unable to survive or worse, with insufficient predators. The introduction of alien species can forever negatively alter an environment.

### HELIUM BALLOONS AND NOTES IN BOTTLES

In the past, classes have prepared helium balloons and bottles with notes and return postcards. The helium balloons were released outdoors and the bottles were thrown out into the ocean with students eagerly awaiting returns that would tell them how far the balloons and bottles had traveled.

We now know that when the balloons finally disintegrate, the helium that is released can cause damage to the ozone layer of the upper atmosphere, and the containers cast into the sea can cause harm to sea creatures that might swallow them or otherwise come in contact with them. We strongly recommend you refrain from helium balloon and bottle note activities.

## THE SAVVY SCIENCE TEACHER

Ms. Tallchief was completing a month-long electricity unit with her sixth graders when the students became fascinated with experiments they did on static electricity. The county science museum had several programs on electricity, so Ms. Tallchief contacted the educational program director at the museum to see if the museum had a program that could extend the static electricity activities that had been done in class.

Together, Ms. Tallchief and the museum staff modified two existing museum programs—one using the museum’s large Van de Graaff generator and a weather program about lightning—to take advantage of the students’ in-class activities and give them a safe experience in observing lightning-like strikes created by the Van de Graaff generator.

Working with the school librarian, Ms. Tallchief assigned trade books and magazine articles for students to read the week before the planned museum visit. Following the reading and research, the class prepared a list of questions that they would like answered during the museum visit. The class sent the questions by e-mail to the museum instructors and kept copies of the questions in notebooks they planned to bring to the museum.

### Connections

- ▶ Adler, D.A., N. Tobin (Illustrator). 1999. *How Tall, How Short, How Faraway*. Holiday House.
- ▶ Foster, G.W. 1999. *Elementary Mathematics and Science Methods: Inquiry Teaching and Learning*. Arlington, Va.: NSTA Press.
- ▶ Keteyian, L. 2001. A Garden Story. *Science and Children* 39 (3): 22–25.
- ▶ Robertson, W.C. 2001. *Community Connections for Science Education: Building Successful Partnerships*. Arlington, Va.: NSTA Press.
- ▶ Russell, H.R. 2001. *Ten-Minute Field Trips*. Arlington, Va.: NSTA Press.