FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Environmental Activities for Youth Clubs and Camps

Office of Overseas Programming and Training Support (OPATS)

March 2017
Peace Corps
Publication No. M0126

USAID
FROM THE AMERICAN PEOPLE

Peace Corps

Environmental Activities for Youth Clubs and Camps

Office of Overseas Programming and Training Support (OPATS)

March 2017
Peace Corps
Publication No. M0126

Acknowledgments

*Environmental Activities for Youth Clubs and Camps (*Peace Corps Publication No. M0126) is a compilation of activities that Peace Corps Volunteers and other youth workers can use and adapt to help kids learn about a wide range of environmental topics. The activities have been selected according to their suitability in nonformal situations and their educational value, especially in the countries where the Peace Corps is serving.

Peace Corps Environment Specialist Dave Wood within the Office of Overseas Programming and Training Support (OPATS) selected and edited the manual's activities, many of which were contributed by Peace Corps posts worldwide. OPATS program assistant Chris Lindstrom collected activities from the posts and organized them into categories, and Peace Corps intern Ellen Alderton located additional activities and helped to edit this manual. Laura Pirocanac, strategic content and design specialist, and Heather Mann, contractor, provided further editing for this publication. Contractor Alena Jarnik, with guidance from multimedia specialist Theresa Welling, provided graphic design and layout services. Other major contributors include Peace Corps Literacy Specialist Annaliza Thomas, Youth and Volunteerism Specialists Karen Scheuerer and Carl Triplehorn, Peace Corps/Panama Program Specialist Amy Stypa, Sidwell Friends School drama teacher Tim Reagan, and Peace Corps intern Akoo Donahoe.

The manual distills the creative thinking of many different sources. The following Peace Corps posts contributed activities that they have found to be successful:

- Armenia
- Benin
- Cameroon
- Costa Rica
- Dominican Republic
- Ecuador
- El Salvador
- Jamaica
- Mexico
- Nicaragua
- Paraguay
- Peru
- Romania
- The Gambia
- Togo

The Peace Corps also gratefully acknowledges the activities contributed by or inspired by the following sources:

- *101 Nature Activities* by Elizabeth Rundle and Jane Sanborn, Sanborn Western Camps
- *A Community Guide to Environmental Health* by Jeff Conant and Pam Fadem, Hesperian Foundation
- *Engaging Youth in the Outdoors* by the Izaak Walton League of America (IWLA)
- *Creek Freaks Curriculum* by IWLA
- *Sharing Nature With Children* by Joseph Cornell
- *Zoomy Zoomy* by Hannah Fox, Tusitala Publishing (e-book version also available)

Finally, some activities were excerpted from complementary Peace Corps publications:

- ***Environmental Education in the Community*** (No. M0075)
- ***Environmental Education in Schools: Creating a Program That Works*** (No. M0044)
- ***Teaching in the Whole Garden*** (No. R0085)
- ***Intensive Vegetable Gardening for Profit and Self-Sufficiency*** (No. R0025)

Table of Contents

Courtesy of Lily Durkee

Introduction

Introduction

In Peace Corps posts around the world, Volunteers are helping kids learn about the environment. For example, they are:

- helping kids in Paraguay organize a community Earth Day celebration;
- leading Jamaican kids in a game of Ecosystem Musical Chairs;
- assisting kids in Togo to establish a tree seed bank;
- organizing Armenian kids in a game teaching them about the importance of trees; and
- writing a play about climate change entitled "Zombie Apocalypse" and making a video of Ecuadorian kids performing it.

Why are these Volunteers, and many others, bringing environmental education to kids? For many reasons, including the following:

Young kids are impressionable and open to forming positive behaviors and attitudes that will last a lifetime**.** Naturalists and committed environmentalists often credit experiences they had when they were very young as key inspiration for their adult interests, values, and lifestyles. Time spent providing kids with engaging environmental experiences can have lasting impact. Can you recall the experiences you had as a kid that made you who you are today?

Kids can make meaningful contributions to environmental stewardship efforts. They can plant trees, organize recycling efforts, and spearhead litter cleanups. Many have responsibilities in the home and on the farm and the field that may appear surprisingly advanced to those familiar with childhood in the United States.

Kids can also educate adults. They can organize Earth Day and Arbor Day celebrations, paint murals and put up posters in public places, hold science fairs, and construct demonstration woodlots and gardens on school grounds. They can communicate what they have learned to their parents and relatives.

Kids are often drawn to environmental themes, whether they involve nature appreciation, ecology, natural science, current issues, or community welfare. These activities can effectively keep kids engaged, enthusiastic, active, and happy.

Peace Corps Volunteers have demonstrated marked success working with youth over the years. Roughly 70 percent of Peace Corps Volunteers work with youth. Many teach in school classrooms, particularly English and science; many others work with kids in nonformal settings, such as in clubs and camps and even spontaneously with kids hanging around the neighborhood.

It can be a challenge, however, to come up with environmental activities to implement. Materials and equipment may be scarce, facilities may be lacking, and sources of ideas may be hard to find, particularly in remote villages where internet connections are unreliable. Consequently, the Peace Corps has produced this compilation of environmental activities. It is designed primarily to help Peace Corps Volunteers, as well as other youth workers, working in nonformal situations such as clubs and camps. Most activities can also be adapted for formal classrooms.

The manual is intended to serve as a sourcebook for Volunteers and others to draw upon when implementing educational programs. It does not dive into how to develop such programs. For ideas about how to do that, the reader can consult Peace Corps manuals *Environmental Education in Schools* (No. M0044) and ***Nonformal Education*** (No. M0042). The activities here are primarily organized according to subject matter, such as soil and water, trees, nature awareness, and ecology, with additional activities included under Service Learning Activities and Games.

Peace Corps posts from around the world contributed many of the activities here—activities they have seen employed successfully. Other activities were suggested by environmental educators or inspired by manuals produced in the United States and elsewhere. These activities, as well as the authors' original contributions, were selected because:

- the materials they require are typically available at Peace Corps sites,
- they deal with topics relevant to Peace Corps situations, and
- they are suitable for nonformal settings like clubs and camps.

Each activity description includes objectives, estimated time needed, materials, and appropriate age ranges:

- "Young" roughly equals ages 4–10.
- "Middle" refers to ages 11–14.
- "Older" refers to ages 15–18.

Volunteers are encouraged to revise and adapt the activities to fit your own situation and make them yours. And when you are inspired to come up with new activities on your own, please let your program manager know so that Volunteers in other countries know about them and can benefit from your creativity.

Selecting Activities

Here are some factors to keep in mind when selecting activities from this manual:

1. The activity's educational value
2. The activity's feasibility
3. Whether the activity is culturally appropriate
4. Whether the activity is engaging and fun
5. Whether the activity is age appropriate
6. Your style of teaching, personality, and interests

1. Educational Value

There are several reasons to carry out an educational activity. For example, it may reinforce a concept that is part of a school curriculum and keep kids busy and show them a good time. The most important reason for selecting an activity, however, is the impact it can have on the kids' lives and the welfare of the community to which they belong—in other words, its educational value.

The premise is that educating kids about the environment will have an impact *on their behavior,* either when they are still kids or in the future when they are adults. Awareness and knowledge are ideally the means to the end, not the end in themselves. Behavior change that can be reflected in environmental conditions is the ultimate justification for spending time on environmental education. This is true even with kids.

So, think about the knowledge, skills, and attitudes (KSAs) that your kids need to have in order to be willing and able to carry out specific environmental actions. Will the activities you have in mind be effective in helping your kids develop those KSAs?

To help you pinpoint the most relevant topics to focus upon—the ones that will have the greatest impact on the kids and on the community in which they live—try to identify the following:

The priority environmental issues confronting your community. What deserves attention? Should you focus on deforestation, soil erosion, or water contamination? Are you seeing litter everywhere, or perhaps unsustainable harvesting of wild plants and animals? Given current trends, what is the future of the community likely to be?

It is recommended that you and your counterpart evaluate the environmental situation facing you, as part of your overall PACA-guided community assessment.[1]

The solutions to address the issues. Should people plant trees, plow on the contour, or construct permagardens? Is the first order of business starting a recycling campaign, building sanitary latrines, or establishing a community nature reserve? What do people need to know how to do, and what will inspire them to do it?

How kids can contribute toward implementing these solutions. Depending on the issue and the actions needed to address it, kids can help confront the issue in the future when they are adults or they can contribute now. If you are thinking about what the kids will eventually be doing, your activities can lay the groundwork for ultimately inspiring and enabling them to bring about positive change. Activities that encourage nature appreciation or teach basic ecology might be the most effective strategies. If your kids are capable of bringing about change in the community now, then consider what knowledge, skills, and attitudes they need to fulfill their potential, and select activities that will impart these KSAs.

For example, let's say that you have noticed a lot of litter scattered around the neighborhood, and you see that the solution is simple enough: picking up trash, separating the recyclables, and hauling them to a recycling center. This tells you that focusing on litter is an appropriate topic for your group of kids because they can be motivated to effectively confront a problem in a way that will significantly improve the community.

You determine, then, that the kids will need the following KSAs to be able and willing to contribute:

The kids will:

- know why litter is a problem in the community (K),
- know what can be done to address the problem (K),

1 Ideally, you have learned about Participatory Analysis for Community Action (PACA) in your Peace Corps training and have been planning to apply it when beginning your service. Consult the Peace Corps publication *Using Participatory Analysis for Community Action (PACA) Idea Book* (M0086) for a more in-depth explanation of PACA.

- know which items are recyclable (K),
- be able to separate the recyclable items (S),
- be able to make simple crafts out of recyclable plastic (S), and
- be motivated to initiate and carry out a litter recycling campaign (A).

You can then choose activities that meet these learning objectives.

Bringing About Behavior Change

To maximize your chances of bringing about behavior change, you will need to carry out a careful community assessment. Key to your efforts will be determining what exactly is preventing people from implementing the actions needed to improve their environmental situation. In other words, if the environmental actions you have in mind are such a good idea, then why aren't people already implementing them?

Often, environmental educators think it's simply a matter of awareness and that all they need to do is show people how to carry out an activity and why, and people will carry out the action. Frequently, however, other factors are behind people's inaction. To bring about behavior change, then, you need to identify what those factors might be.

The following table shows the reasons (determinants) that influence why people act as they do.

Reasons for Resisting or Embracing Changes in Behavior: Why People Act the Way They Do

Reasons	Questions to consider
Perceived Competence	Is it easy? Does the individual think he or she can perform the behavior?
Perceived Social Norms	Is it popular? Does the individual think people who matter would approve of the behavior? *People* might include spouses, friends, family members, and religious and community leaders.
Perceived Positive Consequences	Does the individual think that good things will happen if he or she performs the behavior?
Perceived Negative Consequences	Does the individual think that bad things will happen if he or she performs the behavior?
Access	Can the individual get the products or services required to perform the behavior? This also includes an audience's comfort in obtaining desired types of products or using a service.

Reasons	Questions to consider
Cues for Action/ Reminders	Can the individual remember to do the behavior and how to do it? Examples of reminders are radio announcements reminding people of the date and location of a seedling distribution post, and a sticker with the steps for how to plant a particular type of seed.
Perceived Susceptibility/ Risk	Does the individual feel vulnerable to the problem? For example, does a group of farmers feel that it's possible their crops could have cassava wilt?
Perceived Severity	Does the individual feel the problem is serious? A farmer may be more likely to take steps to prevent aflatoxin infection of stored harvest if he or she perceives it to be a serious problem that could cause harm.
Perceived Effectiveness	Does the individual believe the behavior will solve the problem? Example: *If I sleep under a mosquito net, I won't get malaria.*
Perception of Divine Will	Does the individual believe it is God's will that he or she has the problem or should solve it?
Policy	Do existing laws and policies encourage or discourage adopting the behavior? For example, the presence of good land title laws (and clear titles) may make it more likely for a person to take steps to improve his or her farmland.
Culture	Does the culture encourage or discourage adopting the behavior? *Culture* includes the history, customs, lifestyles, values, and practices within a self-defined group. It may be associated with ethnicity or with lifestyle, such as "gay" or "youth" culture.
Carrying out an accurate community assessment requires time and an ability to relate to, and communicate with, people. To further explore how to carry out a behavior change assessment, consult ***Environmental Education in the Community*** (No. M0075).	

2. Feasibility

Consider:

- Are the materials the activity requires available at your site?
- Do you have a satisfactory space in which to carry out the activity?
- Do you have the time to prepare it?
- Will you have the time with the kids that you need?
- If the activity is going to be outside, will the weather be cooperative, or will it be too hot, cold, windy, or rainy?
- Is the activity safe, given the ages of the kids you are working with?

3. Culturally Appropriate

In some cultures, kids may be reticent to voice their opinions in spirited debates or discussions. Boys may not play with girls, and vice versa. Being loud or boisterous may not be encouraged. Some cultures or political regimes may not approve of open-ended debates about controversial issues or government policy.

Try to be alert to the reactions of the kids with whom you are working. If they seem nervous, uncomfortable, or reluctant to join in, you may gently encourage them to give the activity a try, but avoid creating an unnecessarily stressful situation. The activity might just be too strange and dissonant to continue.

4. Engaging and Fun

The activities in this manual are designed primarily for nonformal situations, where participation will usually be voluntary. Therefore, the activities here are thought to be active and enjoyable. They are not lesson plans and are not supposed to resemble school, so they include minimal instruction and no quizzes or exams, unless as a fun part of an activity.

Of course, what is engaging and fun will depend in large measure on the ages of the kids with whom you are working. What works for a 6-year-old will likely seem silly to a 16-year-old. You will need to depend on your sense of the kids you are working with to guide you.

Sharing Nature With Kids

Joseph Cornell, a master environmental educator, has five tips for sharing nature with young kids:

1. **Teach less and share more.** "I believe it is important for an adult to share his [or her] inner self with the child. Only by sharing our deeper thoughts and feelings do we communicate to, and inspire in others, a love and respect for the Earth. When we share our own ideas and feelings, it encourages a child to explore, respectfully, his [or her] own feelings and perceptions. A wonderful mutual trust and friendship develops between the adult and the child."
2. **Be receptive.** "Receptivity means listening and being aware. It is one of the most richly rewarding attitudes you can cultivate while working with children. The outdoors brings out a spontaneous enthusiasm in the child that you can skillfully direct toward learning."
3. **Focus the child's attention without delay.** "Set the tone of the outing right at the start. Involve everyone as much as you can, by asking questions and pointing out interesting sights and sounds. Some children are not used to watching nature closely, so find things that interest them, and lead them bit by bit into the spirit of keen observation. Let them feel that their findings are interesting to you, too."
4. **Look and experience first; talk later.** "At times nature's spectacles will seize the child in rapt attention. But even if those special sights are lacking, the child

can have an experience of wonder by just watching quite ordinary things with close attention. Children have a marvelous capacity for absorbing themselves in whatever they're looking at. Children seldom forget a direct experience."

5. **Cultivate joy.** "A sense of joy should permeate the experience, whether in the form of gaiety or calm attentiveness. Children are naturally drawn to learning if you can keep the spirit of the occasion happy and enthusiastic. Remember that your own enthusiasm is contagious, and that it is perhaps your greatest asset as a teacher."

Source: *Sharing Nature With Children* by Joseph Cornell (1979)

5. Age Appropriate

Beyond enjoyment, you need to consider how appropriate the subject matter is for the kids you are working with. This section contains general summaries of child-development stages and how they relate to environmental education. Every group of kids, however, will be made up of individuals, each with his or her own interests, personality, and way of thinking, and each developing at a different rate. Not every kid will respond to your good efforts in the same fashion.

The Youngest Kids

Young kids up to the age of 10 are limited in their capacity to think abstractly. They are concrete in their approach to the world; tend to see the world in terms of black and white, not in shades of gray; and relate to things they can see and touch more than to those they are just told about. They have not yet developed the thought processes to think logically. They are, however, often curious about and fascinated with the natural world and empathetic with other living things, even less endearing ones like insects. Many adults envy their sense of wonder and feel fortunate if they still possess some of it themselves!

Generally, the best way to keep young kids occupied is to give them positive experiences with nature. Help them notice and appreciate the plants and animals around them. Dealing with difficult global issues, such as species extinction and global climate change, is usually too abstract and overwhelming for them; they can come away with a sense of helplessness. Young kids can also get a lot out of simple community service projects, such as litter cleanups or art projects in public places. They enjoy seeing the results of, and receiving public praise for, their efforts.

Your choices in activities with the youngest kids might be limited, but you can still make a lasting impact by working with them.

The Older Kids

As kids get older, they may express less interest in exploring the wonders of nature, but they typically become increasingly focused on working out their own values, apart from those of their parents. It can, therefore, be effective to explore environmental issues relevant to them. Activities that ask kids to consider where they stand on an issue and to discuss and debate their positions can prove engaging, as these activities can coincide with the kids' stage of development. In particular, a kid's stage of moral development can frame how he or she views environmental issues.

It is important, however, when discussing environmental issues, that kids see how to address them. Many young adolescents are idealistic (as are Peace Corps Volunteers!) and want to feel they can contribute toward making the world a better place. Environmental problems that appear to have no solution can produce a sense of discouragement and then resignation that things will never get better. People with attitudes like these rarely become active agents of constructive change.

6. Aligns With Your Style of Teaching, Personality, and Interests

Your comfort level with activities also matters. Some youth workers find it easy to be silly with young kids; others naturally lean toward quieter, more serious activities. Typically, the more comfortable you feel with an activity, the more successful you will be implementing it. However, you will always need to balance your preferences with the needs and interests of the children you are working with.

You will also need to strike a balance between maintaining order and letting kids be energetic and frisky. On the one hand, kids, particularly in nonformal situations, like to be turned loose to run around and have fun. They are not typically primed in clubs and camps to sit down and listen to directions and instruction. On the other hand, kids look to adults to maintain some semblance of order and discipline, even though they sometimes push back when confronted with adult authority. Order helps kids feel safe and secure, which is very important to them; too much pandemonium can be threatening. So, you will need to provide an environment where the kids can have fun in a controlled way, so they can feel confident that they are in good hands.

Sometimes kids can, and probably will, try your patience. When this happens, the best way to keep them in line is to be confidently and calmly firm. Don't make empty threats, but follow through on what you said you were going to do if things got out of hand. Showing anger gives kids the sense that *you* are not in control and can cause them to feel insecure and unsafe.

In general, you will be most successful if kids pick up that you care about them and are enjoying their company. Kids often sense when someone is uncomfortable in their presence or appears to want to be somewhere else. Often, humor doesn't work if the adult, in trying to be funny, seems awkward and uncomfortable in doing so. It may sound simplistic, but being sincere, warm, and empathetic goes a long way.

Evaluating Your Activities

School teachers can evaluate student progress using a variety of quizzes, oral and written exams, practicals or lab exercises, homework assignments, reports, and essays. They give grades and write report cards. Clubs and camps, however, usually aren't supposed to look like school, so these assessment tools will often work against your efforts to create a fun, energetic environment. Nonetheless, you will want to know what your kids have learned.

First, it is important to select the right evaluation tool. Do you want to know if your kids have learned some facts or a new skill, or if they've picked up an improved attitude about the environment? Do you also want to know if the kids have had fun? Each question requires different assessment techniques.

Assessing knowledge. To see what your kids have learned, you can use various tools that are fun games. In fact, the kids may not even be aware you are assessing their knowledge. For instance, you can make up a Jeopardy!-type game or a quiz contest. For some examples, see the activities Animal Charades, a variation of What Animal Am I? (No. 19), Tree Identification

(No. 126), and Red Light/Green Light (No. 62). A scavenger hunt, in which the kids have to find, say, a pollinator, a piece of trash that can be recycled, or an example of soil erosion can reveal what they've learned. If weather prevents you from heading outdoors, they can complete the activity using carefully selected photos or drawings that contain the objects you want them to know. For example: Find 10 examples of "good" and "bad" environmental activities, or five signs of soil erosion. If your kids can read, use an online tool to develop a crossword puzzle.

Assessing skills. With skills, the most reliable way to assess learning is to observe the kids actually performing the skill.

Assessing attitudes. To determine attitudes, you can simply sit the kids in a circle and ask them what they think. You can also organize debates and role-plays focused on environmental issues, and observe the positions the kids take and their supporting arguments. Kids can record their thoughts in personal journals that they can share with the group or let you read. You might also ask the kids to fill out a written poll or answer questions orally; often, kids are glad to give their opinions. These polls can take various forms:

- Opinion polls, in which you ask kids if they totally agree, partially agree, disagree, or strongly disagree with statements (e.g., "People who throw litter on the ground in the town plaza should be made to pick it up.")
- Ranking of environmental issues, when kids assign numbers to the issues, with 5 being most significant and 1 being least significant
- Value continuum, in which the kids see a line representing a continuum connecting two attitude extremes and indicate where they fit on it (e.g., a line with "Farmers should not use pesticides" on one end and "Farmers should use pesticides whenever they need to" on the other)
- Action survey, in which you ask students questions about their own behaviors, choosing from responses such as *very often, often, seldom,* and *never* (e.g., "How often do you recycle plastic soda bottles?")

You might even be able to poll the kids' opinions before your activities, and then again afterward. With pre-surveys establishing a baseline, you can measure progress more reliably.

You can also notice what the kids decide to do after your activities have finished. Are you hearing enthusiastic suggestions to plant some trees on the town square, paint an environmental mural on the schoolhouse wall, or organize a community litter cleanup?

The fun factor. You will also probably want to know if the kids have enjoyed your activities, aside from having learned anything. You can easily assess this by watching their reactions to your activities or by simply asking them if they had fun or if they would like to do the activity, or something similar, again. It's important that the kids have fun because participation is likely voluntary. (And it is more pleasant for you to be around happy, engaged kids than unmotivated, listless ones!) Ideally, the kids will also learn something from your efforts that will have some impact on their lives and on their communities.

Anecdotal evidence. Another way you can learn what your kids have picked up is by hearing what their parents, teachers, and neighbors have observed. For example, you may hear from parents that their kids are picking up trash and recycling plastic soda bottles at home or instructing their siblings about local plants and animals, thanks to your efforts. Or teachers may remark that their students seem especially interested in a particular environmental topic

that you've covered. Hearing anecdotes from others can be especially helpful with quiet, introverted kids who may not stand out in a group, but who may demonstrate their true knowledge, skills, and attitudes in different settings.

Additional Peace Corps Resources

This manual was designed to complement other Peace Corps manuals, which can also serve as helpful resources for Volunteers helping kids learn about the environment:

Environmental Education in Schools: Creating a Program That Works (No. M0044)

Discusses how to incorporate environmental education into formal school curricula. It includes hundreds of pages of activity examples, intended to inspire Volunteers developing activities of their own to accommodate their particular situations. The activities are not meant necessarily to be used as is. Though they have been collected with formal school classes in mind, most can be adapted to fit nonformal situations.

Environmental Education in the Community (No. M0075)

Describes how to apply environmental education in the community to bring about meaningful behavior change. The manual includes many different examples of community projects, how to establish an environmental youth camp and an environmental center, and how to develop effective community environmental education program strategies.

Nonformal Education Manual (No. M0042)

Explains general nonformal education planning and techniques, for youth and especially adults.

Youth Camps Manual: GLOW and Other Leadership Camps (No. M0100)

Discusses how to plan and manage a youth camp. Topics include different types of camps, camp activities, and counselor training, and a special section on Camp GLOW.

Volunteerism: V2 Volunteerism Action Guide (No. CD062)

Describes how to harness the power of volunteers in the community to meet common goals through collective action.

Youth Development Through English Practice Activities (No. M0109)

This manual discusses important education principles and contains many helpful hints for organizing kids in clubs and camps. It also describes a host of activities, the primary purpose of which is to strengthen English language skills but which can be adapted for environmental education.

Child Protection

As a foundation for all agency programs, the Peace Corps takes a serious and proactive role to ensure that all its activities are safe for children and youth. This is outlined in the Peace Corps Child Protection Policy (MS 648), which holds Peace Corps staff and Volunteers to a high standard of responsibility for ensuring the safety and protection of the youth with whom they interact. This publication provides guidance and suggestions to help Volunteers engage youth in a positive and safe manner. Included are some underlying principles and clear guidelines that Volunteers must be made aware of, and that should permeate the activities described in this publication. Please see the full policy in the appendix or, for employees, on the Peace Corps intranet.

Animal Activities

Animal Activities

1. Adopt a Bug

Contributed by Peace Corps/Mexico

Objective: To appreciate insect characteristics and their roles in ecosystems through an up-close and thorough examination

Ages: Young, middle

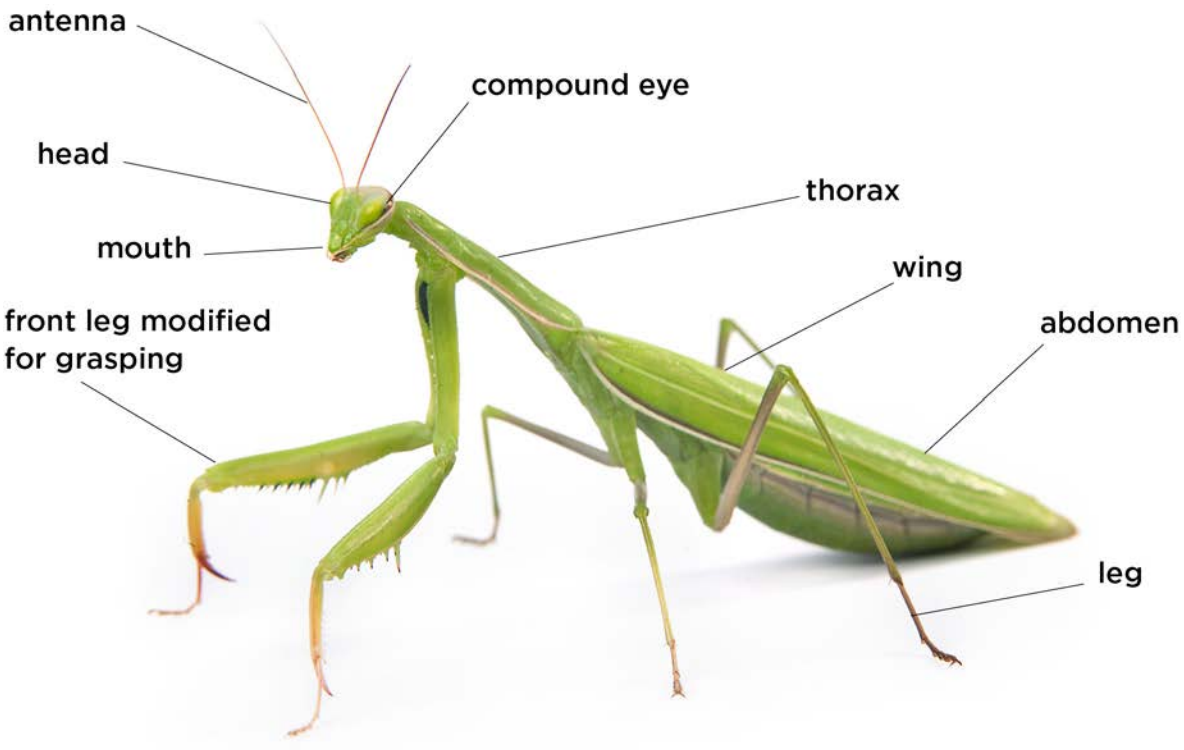
Materials: Transparent containers (2-liter bottles or other large containers); scissors or knife; an insect net (easily made with a wire hanger and pantyhose) and/or a small jar with lid; bug food; sponge (untreated and non-dyed); habitat embellishments (small sticks, dirt or sand, small rocks, etc.); bugs!

Time: 2–3 hours

Procedure:

Kids collect insects, keep them for a day or two, observe them, and release them.

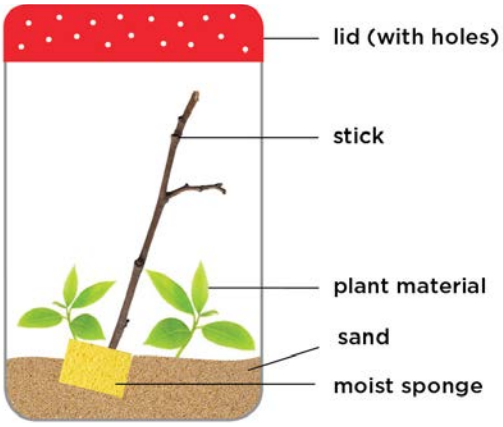
First, you might want to discuss with your kids the anatomy of insects, what makes an insect different from other animals, and why insects are beneficial in the environment. Explain that insects have three segments (head, thorax, and abdomen) and six legs, which makes them different from arachnids (spiders, scorpions, ticks, etc.) and other common bugs (millipedes, pill bugs). Most insects go through metamorphosis with four life stages. A butterfly is a common example: egg, caterpillar (larva), cocoon (pupa), and butterfly (adult).



To help kids learn what insects live in their community and observe them, ask them to create an artificial habitat for each collected bug. First, each student needs a bug jar: a two-liter bottle or other large, plastic container. Place about 1–3 centimeters of dirt or sand in the bottom of the container. Add about a tablespoon of water to moisten the dirt or sand. Then put several long sticks in the jar so the insect has an area to crawl up and down. Insert a small, damp piece of sponge or wadded-up paper so the insect can drink and the jar can maintain humidity. Finally, supervise kids as they puncture holes in the lid for air.

Go out and collect insects with the kids. Look under rocks, in trees, under fallen leaves; wave the net through areas of tall grass; or sneak up on bugs with small jars and catch them inside with the jar lids. Once all the kids have found insects and placed them in their insect jars, they can share observations about their bugs, explain what they will need to live, and bring their insects home for a day or two to observe them.

Insect Jar



Courtesy of PC/Mexico

It is recommended that kids choose an herbivorous insect as they are the easiest to feed. Examples are grasshoppers, crickets, beetles, caterpillars, walking sticks, and fireflies. If kids are keeping such insects, they need to feed them with the exact species of plants on which they found the insects, because many species specialize in the plants they eat. Pollinating insects like bees and butterflies are OK too, but will need a good amount of flowers or ripe fruit. Carnivorous/predatory insects (ladybugs, praying mantises, etc.) need a constant supply of other insects to eat.

Explain that the kids must place their insects in a cool place without direct sunlight. The greenhouse effect of the transparent containers could fry the insects within hours. They should release the insects after a day or two in captivity, preferably back where they came from.

Variations:

Instead of everyone adopting their own bug, a demonstrational bug habitat can be made for community environmental centers or classrooms.

Alternatively, to keep the activity simpler and shorter, give each kid a glass jar with a lid. Find a habitat that supports a good variety of insects. Give each kid 10 minutes to find an insect, sneak up on it, get it in his or her jar, and close it with the jar lid. Once everyone has a captured insect, sit everyone in a circle and pass the jars around, discussing the insects within. After everyone has seen all of the captured insects, release them where they came from. (Be careful when releasing stinging insects; they might be angry!)

Note: Beforehand, find out if any kids are allergic to bee stings. If any of them are, or if you want to be sure that no kids get stung, choose an area to explore that does not have a lot of stinging insects.

Additional Reading:

"Insect Box." *Environmental Education in the Community,* 2005. Peace Corps Publication No. M0075, page 261.

2. Animal Game

Adapted from Sharing Nature With Children

Objective: To learn basic natural history facts about animals

Ages: Young

Materials: Paper, writing implements, rocks or sticks

Time: 30 minutes

Procedure:

Form two equal teams. Have each team choose their own animal and six to eight riddle clues about it. Clues should be progressively easier to guess, from general to specific. Using rocks or sticks, create a playing field as follows, with home base lines approximately 5 meters behind the middle playing line.

Team A's Home Base

Team A

Team B

Team B's Home Base

Teams take turns providing their clues one by one, back and forth, until someone guesses the correct answer, at which time the losing team must turn and run to their home base before being caught by the winning guessers. If a player is caught, he or she must join the other team. The game can continue until one team loses all of its players.

Example

Sample clues:

1. I eat many types of animals, ranging from fish and turtles to deer and wild pigs.
2. Farmers don't like me because I sometimes eat cattle.
3. I mostly hunt at night.
4. I am very quiet and hard to see.
5. I live in many different wilderness habitats: forests, mountains, deserts.
6. I can be found in North, Central, and South America, from Mexico to Argentina.
7. I can be scary, but people are usually thrilled to see me in the wild.
8. And if you haven't guessed who I am yet, I can be hard to "spot."

(Answer: Jaguar)

Variation:

The teams can also come up with true/false questions. When a team guesses the wrong answer, they get chased.

3. Animal Menus

Contributed by Peace Corps/Mexico

Objective: To investigate the diets of different animals by creating menus for various species

Ages: Young

Materials: Poster paper, markers

Time: 1 hour

Procedure:

Kids choose an animal species of the region and investigate its diet, using available resources such as texts, internet, or knowledgeable local people. Make sure that kids select a wide variety of animals, not just the most prominent ones. Once they have completed their research, they can create a poster of the "dishes" that their respective animals consume. These can be dishes that humans eat; however, their ingredients need to reflect the specific foods of their animals. Using a deer or antelope as an example, the menu could include a flower soup, leaf and twig tacos, and a berry cake. Ensure that the dishes reflect the local cuisine and traditional types of dishes in your community. In Mexico, for instance, a customary meal includes a soup, main course, dessert, and drink.

4. Animal Spirits

Adapted with permission from Zoomy Zoomy*, by Hannah Fox (Tusitala Publishing)*

Objective: To build empathy for wild animals and their conservation

Ages: Young

Materials: None

Time: 15 minutes

Procedure:

Begin by asking the kids to lie on their backs and close their eyes. Invite them to go on a journey from their mind's eye, lift up from their bodies, and travel through space, over the rooftops and treetops, until they land in a beautiful natural place. Next, suggest that they hear a sound, and when they look over to where the sound came from, they see an animal. Invite them to watch this animal for a while—how it moves, what sound it makes, what it might be doing—then invite them to step inside this animal's skin and become the animal for a while—slowly taking the shape of the animal and beginning to move as this creature around the room as accurately as they can. Take time for this transformation and exploration. The various animals in the room might interact.

Now, invite everyone to lie back down and become still, and guide the animal spirits to leave the actors' bodies. The kids, in their minds, now travel back over the forest and rooftops, back into the room and their own bodies. Allow the kids to wake up slowly. Now, ask the kids to sit in a circle and share what animal they were and the message the animal spirit left with them to pass on to the human world.

5. Attracting Insects

Objectives: To learn the insects that are in the neighborhood; to learn what some of them eat and where they live

Ages: Young, middle, older

Materials: Depending on the methods: sugar, slightly overripe fruit, beer or rum, paintbrush, white sheet, dishpan, water, outdoor lights (especially ultraviolet or "black" light if available), glass, molasses, slice of meat or fish

Time: Making and setting up attractants: 10–20 minutes per site; several hours to several days, depending on the method employed

Procedure:

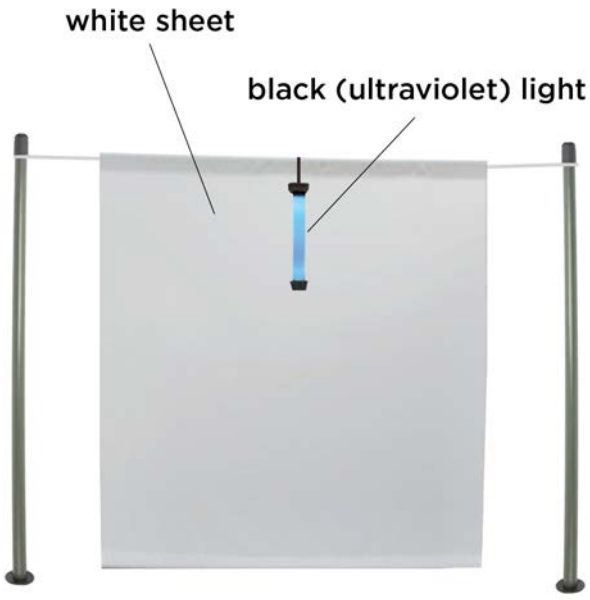
You can attract insects to show kids using several methods. Often these will bring in insects that would be difficult to find otherwise:

- **Sugaring:** This method works especially well for butterflies and moths, which mainly navigate the world with acute senses of smell. The magic formula is a combination of sugar, fermented fruit pulp, and liquids that can be painted onto tree trunks without running too much. Try mixing a teaspoon of rum into honey or molasses, or stirring sugar into stale beer. Another idea is to mash overripe bananas and sugar and set the mixture aside to ferment. The consistency of the final product should be that of a fairly thick paint.

  For moths and other night-flying insects, paint palm-sized patches on fence posts, tree trunks, etc. just before dusk. Plan a route, and after spreading your creation on different places, retrace your steps with a flashlight. The later you can stay up, the more insects you will find. During the day, a different cohort may appear, among them butterflies, wasps, bees, and beetles.

- **Lights:** Also for night-flying insects. Hang up a white sheet when it's dark, and shine a light on it; ultraviolet lights are particularly effective. If you don't want to stay up at night, but want to collect insects to look at in the morning, you might be able to construct a light trap.

- **Ground trap:** This can reveal ground-dwelling insects. Sink a tin can or a jar into the ground so that its top is level with the ground surface. Place a sweet concoction, similar to the recipes suggested for sugaring, at the bottom. Or place some meat or fish in the trap and cover it loosely with a board or leaves, to prevent dogs or birds from getting at it.



6. Bat and Moth Game

Contributed by Peace Corps/Mexico

Objective: To learn how bats find their prey and that they are valuable insect predators

Ages: Young, middle

Materials: Blindfolds

Time: 30 minutes

Procedure:

This active game teaches kids how bats use echolocation to catch flying insects in the dark. Divide your kids into two groups. One group will form a circle; this will be the boundary. The others will be "bats" and "moths" inside the circle. Blindfold one volunteer inside the circle; this kid will be the bat. The other kids inside the circle are moths. The bat will periodically yell ''BAT!'' and the moths will respond with ''MOTH!'' Using only the sense of hearing, the bat will have to capture (tag) the moths that are trying to avoid getting caught. If either bat or moths go too near the edge of the circle, the kids tap them twice on their shoulder. Once tagged, the moths join the circle. Kids can then take turns being bats, moths, and boundary markers.

Make sure the kids walk, not run. Otherwise, the blindfolded kid may easily run into someone or something.

7. Bird Watching

Objectives: To learn to notice, identify, and appreciate the birds living in the community, and to begin learning about their lifestyles and natural history

Ages: All ages, including adults

Materials: Paper, drawing materials

Time: Varies according to the time spent introducing and looking for birds

Procedure:

Birds are the most conspicuous vertebrates, and the plumages and calls of many of them are attractive and interesting. As such, they often draw the attention of environmental educators. Birds also can be challenging to show kids. They move around and may not be where you want them to be. They also are usually wary of humans and don't allow close approach; bird-watchers in the United States get around this by using binoculars, but how often are these available in Peace Corps situations?

Nonetheless, you can have the kids carry out engaging activities that introduce them to birds and, with a little luck, take them out into the community to discover birds for themselves.

To begin, it will be helpful to know the birds you are going to encounter. Ideally, you should obtain an illustrated field guide to your area and use it to try to identify the birds in your community. Once you know the birds most likely to be encountered, you can create a local field guide that illustrates just these birds, as a comprehensive countrywide or regional field guide will be too overwhelming for bird-watching novices, especially young kids. You can

prepare a community field guide with either photos or illustrations or by drawing and coloring the birds yourself on sheets of white paper that can then be stapled or taped together to make a booklet. Fill in, as best you can, basic natural-history information, such as habitat and behavior. Better still, have your kids make the illustrations, copying the field guide pictures. They can work in pairs, and each pair can have its own guide.

Take the kids, with their field guides, on a bird walk. When you see a bird, ask the kids as a group to note:

- **Plumage:** What colors are the back, belly, head, wings, and tail? What markings do you see (bars on the wings, markings such as spots or streaks on the breast, stripes—"eyebrows"—above the eyes, rings around the eyes, etc.)?
- **Beak:** Short and thick like a sparrow for cracking seeds? Thin and small for catching insects? Hooked like an eagle's for tearing apart meat? Spear-like for catching fish?
- **Size:** How large is the bird? In the United States, bird sizes are compared to small sparrows, medium-sized robins, or large crows. You may know small, medium-sized, and large common birds in your country that kids can compare to the birds they see.
- **Shape**: Is the bird long, tall, thin, or fat? Is the head comparatively large or small? Are the wings broad, narrow, rounded, pointed, or curved? Is the tail long, wide, short, pointed, forked, or thin?
- **Habitat:** Do you see the bird in a field, some bushes, a hedgerow, an orchard, scattered trees, a forest, a lawn, a village, a stream, a marsh, or the open sky?
- **Behavior:** Is the bird hopping or walking on the ground, darting through shrubs or trees, sitting on the end of a branch, visiting flowers, creeping up tree trunks like a woodpecker, swimming, diving, standing in shallow water, or flying through the air? If it is flying, is it soaring with wings held outstretched, flying rapidly in a straight line, alternating flapping and gliding, or flopping laboriously for short distances?

Keeping a List of Bird Sightings

On a sheet of poster board, keep a running list of the birds your kids see. For each species, list, in columns, the species, locations, dates, the kids who saw the bird, and notes. Keeping a list and putting it in a public place, like a school or community center, can bring attention to the common birds of the neighborhood and make the search for birds a game in which kids try to see as many birds as possible. Kids can also apply their bird knowledge in painting murals and setting up exhibits that educate the rest of the community about their birdlife.

8. Camouflaged Critters

Objective: To illustrate how animals can be camouflaged in their habitats

Ages: Young

Materials: Anything that children can use to make small, imaginary creatures: e.g., sticks, pebbles, leather and cloth scraps, paper, crayons, tape, glue, and scissors

Time: 30 minutes

Procedure:

Assign a micro-habitat (a shrub, a small area of grass, a tree, a stone wall, etc.) to a pair of children. Have the children make one or two creatures to fit into the assigned habitats and place their critters in that habitat. (No fair hiding them under anything!) All pairs should then visit each micro-habitat and try to find the critters. Critter creators should point out their creatures if they are not found within a reasonable amount of time (but hands behind back until then). Which were easiest to find? Which were most difficult? Why?

Variation: Un-Nature Trail

Adapted from Sharing Nature With Children

Another way to carry out this activity is with human-created litter that you have collected. Choose a 15- to 20-meter section of trail, and place 10 to 15 human-made objects along it. Some should stand out significantly (like brightly colored balloons), and others should blend in and be more difficult to pick out (like a dark green object hanging with similarly colored leaves in a tree). Keep the number of objects planted a secret. Instruct the students to walk one at a time (spread them out) to the end of the trail counting the number of objects they find along the way and then whispering that number in your ear when they reach you at the end of the path. If no one finds the total number (ideally), tell them there's more; then, let them start over again. At the end of the game, discuss how coloration and camouflage benefit animals. Then, if possible, try to locate some camouflaged insects or animals.

9. Camouflage Hide and Seek

Contributed by Peace Corps/Mexico

Objective: To learn how animals camouflage themselves by playing a variation of hide and seek

Ages: Young

Materials: For the variation activity, string and assorted objects of various colors

Time: 10–30 minutes

Procedure:

Explain to the kids that they will be playing hide and seek. The rules, however, are slightly different. The finder is the hawk and will not move. The kids who hide must leave a portion of their bodies showing (e.g., a finger, a shoe, some hair). The hawk will close their eyes and count to 30 while everyone hides, and then will call out where they see other kids hiding. The best hiding place (the person who best uses the concept of camouflage, as decided by the instructor) will be the next hawk. If the kids are good at hiding, challenge them to move closer to the hawk and see who can get the closest without being seen. Change locations periodically.

After the game, go over why camouflage is critical to the survival of so many animal species. Ask kids to name examples of animals that camouflage themselves. To discuss further, ask the kids why so many plants and animals are not camouflaged. Why are there colors besides green and brown in nature? The answers would be: (1) to attract a mate—e.g., birds, some lizards; (2) to attract a pollinator—e.g., flowers; (3) to warn other animals to stay away because they are poisonous or dangerous—e.g., wasps and bees, many caterpillars, butterflies, some frogs and salamanders, coral snakes; and (4) to pretend they are poisonous or dangerous by mimicking animals that are—e.g., various butterflies and other insects, some snakes.

10. Creating a Schoolyard Wildlife Habitat

Objectives: To become acquainted with local wildlife and their life requirements; to educate students and others about local wildlife

Ages: Young, middle, older

Materials: Dependent on the features of your wildlife habitat

Time: Planning and construction will require many days

Procedure:

This is a great activity for teaching kids about local wildlife and how to take care of it, not to mention creating an educational resource that teachers can use to teach others. As a service project, it also helps kids become citizens who can work effectively to make their communities better places to live.

The National Wildlife Federation (NWF), a prominent conservation organization, sponsors a Schoolyard Habitat program that guides kids in creating wildlife habitats in their schools. Once kids have created the habitat, NWF will send a document officially certifying the habitat, as well as a press release that your kids can use to publicize their accomplishment. To be certified, your habitat must include four features: food, water, cover, and places for wildlife to raise their young. NWF stresses that you do not need very much land to do this; in fact, some certified schools have no land at all!

For more information on how to join the program, and to find a host of ideas for creating a habitat, visit **www.nwf.org/How-to-Help/Garden-for-Wildlife/Schoolyard-Habitats.aspx**. Many of the ideas provided are intended for United States schools, but you can adapt many of them for your particular country.

11. Date a Mate

Objective: To show how efficiently some insects, such as moths and butterflies, find their mates through a highly developed sense of smell

Ages: Young

Materials: Blindfolds, scented objects (two of each kind)

Time: 30 minutes

Procedure:

Divide your kids into two equal groups. One group forms a circle; the other goes inside the circle, which forms the game boundary. The insiders are male and female moths. Blindfold half the insiders and give each a scented object. These are the males who will identify their partners through their sense of smell. Give each remaining insider a duplicate scented object. These are the females who will be found by their scents. The "females" position themselves in one place within the circle. The blindfolded "males" try to find the "female" who has the same scented object that they have. When successful, the pair joins the outer circle. At the end, discuss other means insects use to recognize mates (e.g., sound, such as crickets; light signals, such as fireflies).

12. Day of the Dead: Species Extinction

Contributed by Peace Corps/Mexico

Objective: To learn about local endangered and extinct species while celebrating the Mexican holiday the Day of the Dead

Ages: Young, middle

Materials: Information on endangered/extinct species; pens and pencils; photos of animals and plants; Day of the Dead decorations and paraphernalia

Time: 1–2 hours

Procedure:

The Day of the Dead is celebrated every November in Mexico. During this holiday, Mexican family and friends gather to celebrate and remember their dead loved ones. This occasion is often marked by building altars and making visits to cemeteries. For this activity, have kids research what animals and plants are endangered or extinct in your region. Make a list of the species and assign one to each kid, who will then gather information on that endangered or extinct species, draw or print out a photo of it, and make an information card for the group altar.

The kids will then present their species to the group and place their cards and drawings or photos on the Day of the Dead altar. Use this opportunity to discuss how humans impact biological diversity.

Variation:

Making Day of the Dead masks is both a traditional and a fun way to celebrate this holiday. Mask styles can differ greatly between regions, so be sure to research them ahead of time. Or perhaps kids can make masks of different endangered species.

To make a mask, begin with an inflated balloon slightly larger than the student's head. Tear long strips of newspaper roughly 3 inches wide, and fill large mixing bowls with one part flour to two parts water. Students should dip one strip at a time into the flour/water mix and place the strip over their balloon. Masks should have at least five or six layers of paper. Set them out to dry for a few days. Afterward, students can pop their balloons, cut out the mouth and eyes, add facial features, decorate the masks, and wear them.

13. Design a Bird

Contributed by Peace Corps/Armenia

Objective: To learn how birds can adapt in order to survive

Ages: Young, middle

Materials: Paper, drawing materials, flip chart paper, pictures of different birds if available

Time: 45 minutes

Procedure:

Begin by asking the kids to list the tasks birds have to carry out successfully to survive. The list should include find, catch, and eat food; build a nest safe from predators; attract a mate; and protect itself and its young against predators.

Courtesy of PC/Mexico

The next step is to show the kids how bill shape and food choice are related. Beforehand, on flip chart paper, draw diagrams of bill shapes in one column and different foods in another. Ask the kids to match them. Illustration will have the following beaks: bird of prey (rodent); woodpecker (chisel for digging into wood for insects); small insect eater; sparrow or finch (seeds); heron (spear for catching fish; duck (aquatic plants); and sandpiper with long bill, such as a snipe (worms underground).

Now ask the kids if they know how birds attract mates (bright plumage, songs, and displays). Ask them to tell you any pretty birds they know of and show them some pictures of some (e.g., flamingo, parrot, bird of paradise) if you have them. Now ask the kids why being so gaudy and conspicuous might be risky. (The birds can attract predators.) So what do the birds have to do in order to survive? (They have to be both conspicuous and attractive, yet also have successful strategies for avoiding, hiding, or defending against predators.)

With this introduction, organize the kids into pairs, and ask each to draw a fantasy bird on a large piece of paper big enough for everyone to see. Give them five minutes to do this, and tell them it is not important to be artistic. Go on further to ask students how their fantasy bird will attract a mate, catch food, eat food, defend itself and its young, build a safe nest, and hide itself and its young. Once each pair is finished, ask them to share their pictures and describe the features and behaviors of their creations that enable them to be successful.

14. Group Creature

Adapted from Sharing Nature With Children

Objective: To learn basic facts about animal characteristics and behaviors

Ages: Young

Materials: None

Time: 20 minutes

Procedure:

In groups of three to six, ask kids to choose a creature common to the area, and tell them they will have to recreate the creature using themselves. They should keep their animal a secret and take five minutes to quietly prepare. Each team will then act out its respective creature for an expert panel composed of their peers or the facilitator(s), who have to guess what they are modeling through their mime. Only natural objects can be used to imitate any animal noises—no voices!

15. Insect Exploration

Contributed by Peace Corps/Armenia

Objective: To illustrate insect diversity and how their niches and lifestyles differ

Ages: Young, middle

Materials: Paper, pen; markers or crayons (if drawing pictures); hand lenses; bug jars

Time: 45 minutes

Procedure:

Before you begin, locate bushes, trees, or other plants that kids can examine. The ideal plant will have a variety of accessible micro-habitats: bark, stems, leaves, fruits, fallen leaves, and especially flowers. Take the kids outside to the plants you have selected, and ask them, individually or working in teams, to record all of the insects and other animals they see living on the plants. They should describe each insect or animal, even if they don't know its name, where on the plant they found it, and what it was doing (eating, being eaten, pollinating, etc.). They can count insect signs as well, such as chewed leaves, holes in the bark, cocoons, plant galls, tunnels left by leaf miners, and nests. Encourage them to draw pictures of all of the plants and animals they find. They can also catch the individual insects by maneuvering them into glass jars and closing them with the jar lids.

Once they are finished, gather the kids and ask them to share their observations (and pass around their captured insects and drawings). Ask them to relay how many insects and animals they found, where they found them on the plant, and what the animals were doing. You can record each group's data on a chalkboard or flip chart, combining the observations from the same plant species. Use the results to illustrate the diversity of life that can be found even in small places and how different lifestyles allow diverse living things to coexist. Kids can summarize what they have learned by drawing the plants studied, the insects and animals found on them, and where. They might also prepare illustrated insect guide booklets for school kids and others in the community.

16. Make a Nest

Adapted from Sharing Nature With Children

Objective: To gain appreciation of the ability of birds to make nests

Ages: Young

Materials: Twigs, mud, straw, grass, other nest-making natural materials; pebbles

Time: 20–30 minutes

Procedure:

In this activity, kids try to make nests. Before beginning, you can take the kids around the neighborhood and try to find examples of bird nests (having scouted the area beforehand). When you find a nest, ask the kids to note the details of its construction: What materials did the birds use? What is its shape? How is it fastened to the branch? How is it hidden? Be sure to make clear to the kids that they need to leave any active nests alone. If you are certain that

a nest is no longer in use, you might retrieve it. Bring it back to your room for a nature corner display. Or you can ask a pair of kids to take the nest apart, separate the materials, and count them. How many twigs, grass stems, and even bits of trash and paper did the birds use? How did the birds hold the materials together so the nest didn't fall apart?

Once the kids are ready, organize them into pairs or small teams. Ask them to go and collect materials with which to make nests, or provide the kids with materials that you have collected beforehand. Give them 15–30 minutes, or until they start to become bored, to build the sturdiest nests they can. Once they are done, they can test them by placing pebbles into the nests to represent eggs. The kids will likely find that building nests is not easy, even with the use of hands. They can ponder how much more difficult it would be using only their mouths and feet, like birds do!

17. Name That Animal

Contributed by Peace Corps/Mexico

Objective: To show how animals are adapted to their environments and lifestyles

Ages: Young

Materials: Slips of paper with animal traits; bags or bowls; paper; crayons, colored pencils, or markers

Time: 30–60 minutes

Procedure:

Beforehand, choose three or four different categories of animal characteristics and designate a bag or bowl for each. Possible categories include habitat (e.g., forest, ocean, desert, grassland, tundra, jungle); how it moves (e.g., gallop, swim, fly, walk, climb); type of skin (e.g., slimy, feathers, exoskeleton, fur, scales); how it protects itself (e.g., teeth, venom, shell, camouflage, ability to escape, making noise); how people use it (e.g., food, pet, hunting, skin, as enjoyment, as a symbol); and/or how it gets food (e.g., dig, hunt, decompose, lure, depend on humans). Write the different traits of each category on small slips of paper, and place them in the appropriate bags or bowls.

Begin the activity by introducing the idea that animals have developed different physical traits to adapt to different lifestyles and environmental conditions. Then ask the kids to take one slip from each category and draw an animal that features all of them. This animal may be real or imaginary—even silly. In addition to drawing and coloring their new animals, the kids should label the special traits of their animal and give it a name.

18. Noah's Ark

Adapted from Sharing Nature With Children

Objective: To learn basic facts about animal behavior

Ages: Young

Materials: Index cards or paper and pencil

Time: 20 minutes

Procedure:

First, count the number of people in your group and make a list of half that many animals. Then write each animal's name on two cards. If there is an odd number of players, one animal will need to be written down three times. Shuffle the cards and pass them out, asking the kids to read and memorize their animals—but keep them secret—and then pass their cards back. The kids now assume their animals' mannerisms, including shapes, movements, and sounds, without talking or acting like a human. With this evidence, the kids are to find their respective mates, whereupon they enter a designated area known as the "ark."

19. What Animal Am I?

Contributed by Peace Corps/Armenia

Objective: To learn basic natural history of animals and their habits

Ages: Young, middle, older

Materials: Animal pictures or paper for writing the animal names, pins or tape

Time: A few minutes per animal

Procedure:

Pin or tape a picture of an animal on the back of one kid in the group, but don't show the kid the picture. Have him or her turn around so all the other kids can see what animal he/she has become. The kid then asks questions to discover his/her own identity. The other kids can answer only yes, no, and maybe. You can also use sticky notes or other materials you have on hand. One variation of this game is to use things found in nature rather than just animal names (e.g., sun, rock, ocean).

Variation: Animal Charades

Set up an area where the kids can act out the behavior of an animal. Write the names of at least 15 domestic animals and 15 wild animals on separate pieces of paper.

Randomly give each kid a piece of paper. In turn, each kid must come to the front of the room and act out with noises and body gestures the animal they were given.

As a follow-up, ask the students to identify one or more animals that coexist. Have the kids dramatize the animals, their relationships, and the ecosystem where they live.

20. What Habitat Am I?

Contributed by Peace Corps/Armenia

Objective: To learn about animal habitats

Ages: Young

Materials: Paper for writing habitat names, pins or tape

Time: 30 minutes

Procedure:

This is a variation of the previous animal charade game, except in this case, kids are trying to guess habitats instead.

First, make sure the kids know what a habitat is (an animal's home), and give some examples (forest, desert, river, ocean, meadow, the North Pole, etc.). Now organize the kids into teams of two to three and give each a different habitat. They must then act out their habitat until the other children guess which one it is. For example, in the meadow habitat, one child might be a deer, another some grass, another the sun, and another a snake. In a river habitat, two kids might be water, one might be a fish, and one might be a rock. Encourage them to be creative and not to stop acting out their habitat until the other kids have guessed what they are.

21. Wildlife Habitats and Human Impact

Contributed by Peace Corps/Armenia

Objective: To teach the features of a healthy habitat and what happens to wildlife when the habitat becomes degraded

Ages: Young

Materials: None

Time: 30 minutes

Procedure:

This active game teaches what a habitat is, and that populations of living things are continuously affected by elements of their environments.

Begin by reviewing the definition of habitat, and discuss a habitat's components. Emphasize food, water, and shelter. (Explain that although it is a component, we will not be using space in this game.) Show the kids hand signals for food (hands to the stomach), water (hands to the mouth), and shelter (hands forming an upside down "V" over the head). Have them practice making the signals quickly as you yell out, "Food … water … shelter … water … shelter … food!"

Select about a third of the group, and ask them to go to one side and line up. The rest of the group lines up on the other side. Explain that the kids in the smaller group are a plant-eating animal (choose one appropriate to your location) and that everyone on the other side makes up the animal's habitat. They must turn their backs to one another. On the count of three, each animal decides what it needs (food, shelter, or water) and each habitat kid decides what he or she will be (food, water, or shelter); each kid (animal or habitat) makes a corresponding hand signal. On the next count of three, both groups turn around and face one another. Remind them that they must choose just one signal (or habitat component) and keep that same signal until the end of that round. They may not change signals after seeing the signals that the other side is making.

On the next count of three, the habitat kids stay where they are, and the animals go over to them, get what they need (food, water, or shelter), and bring them (just one habitat component per animal) back to the animal side. If an animal cannot find what he or she needs (e.g., if there is no water left for a thirsty animal making the water hand signal), that animal

must die and become a part of the habitat, continuing the cycle of life. Encourage kids to make their "death" dramatic and fun so they won't want to cheat in order to "stay alive."

Demonstrate the game with the help of one of the students. (You be the animal, and have the student be a habitat component.) Play several rounds and watch the animal population fluctuate.

Next, ask the animals to turn their backs while the habitat gathers around you. (It is a good idea to have another teacher distract the animals during this time if possible.) Say, "People have trampled the meadows. There is no food left for the animals, only water and shelter. So you can only make the signals for water and shelter, *not food*." Play a round, and then announce that all the hungry animals are dead animals because there is no food.

Next, gather the habitat around you again and say, "People have polluted all the water. There is no food and no water now—only shelter. You can only make the signal for *shelter*!" Play another round, and then announce that all the thirsty and hungry animals are dead animals because there is no food and no water.

For the last round, tell the habitat that all of the trees have been chopped down and that there is no more shelter. Have them sit down quietly, and tell them that when the animals turn around to face them, they should just smile and wave. All the animals die. Explain that this is what happens when we don't take care of habitats. If we cut a tree down or pollute a river, we are not just affecting that tree or that river. We are also affecting many living things. Everything is connected.

Courtesy of PC/Mexico

Ecology Activities

Ecology Activities

22. Carmen's Farm

Contributed by Fernando Gonzalez, Agriculture Specialist, Peace Corps/Paraguay

Objective: To learn how living things are connected in an ecosystem, as illustrated by Carmen's Farm

Ages: Middle, older

Materials: Paper (large pieces of butcher paper are ideal), drawing utensils, art supplies

Time: 30–45 minutes

Procedure:

Carmen's Farm is the extraordinary creation of the family of Fernando Gonzalez, Peace Corps/Paraguay staff member—and especially his mother, Carmen. In less than a hectare (2.2 acres), they have planted at least 10 different crops; 13 species of medicinal plants; over 40 species of trees, including 18 kinds of fruit trees; and a variety of miscellaneous plants such as bamboo and Leucaena. They are also raising honeybees, chickens, quail, pigs, rabbits, and even a few cows. A fishpond is the home for tilapia. All this comes together to make a beautiful, comfortable, and always interesting human habitat, and all accomplished without the need for pesticides and artificial fertilizer. The farm succeeds because of its great diversity and because it is a high-functioning ecosystem. By diagramming how everything in the farm is connected, kids can see how healthy ecosystems can sustainably provide for human needs.

Organize the kids into teams of two to four, and distribute paper and drawing utensils. Have them diagram and illustrate the following Carmen's Farm ecological connections:

- The honeybees pollinate many of the crops (for example, watermelon and peppers), medicinal plants, and trees.
- Bumblebees and stingless bees pollinate other crops (such as tomatoes and mangoes) and plants.
- Tiny wasps pollinate the figs.
- Bats pollinate some of the trees (for example, *Inga* and *Genipa americana*).
- Hummingbirds pollinate some of the trees (for example, *Albizia*) and garden flowers.
- Bumblebees nest in holes in the bamboo.
- Stingless bees nest in a couple of the trees.
- Bats nest in tree holes.
- Hummingbirds nest in bushes.
- Some crops feed the animals (for example, sugar cane, cassava, sweet potato, pigeon pea).
- Most crops and fruits feed people.

- Some crops feed the tilapia (for example, *Genipa americana,* star fruit, pigeon pea).
- At least eight species of birds nest in the trees.
- The birds help control insect pests.
- One species of bird, a falcon, feeds on snakes.
- Bats nest in tree holes.
- At night, many bats help control mosquitoes and other insects.
- The animal manure and crop residues go to a worm bin where the worms process it into compost.
- The compost goes to fertilize the crops.
- The leaves of legume trees (*Inga, Albizia, Leucaena*) provide the nutrient nitrogen to the soil.
- Insect larvae in the compost serve as food for the chickens and quail.
- Animal manure also goes to a biodigester that provides gas for cooking.
- Some plants are planted among the crops to keep away insect pests.

Once the kids have finished their illustrations, wrap up the activity by asking them how the Carmen's Farm ecosystem does the following:

- Provides nutrients to the crops and trees without fertilizer. (Compost is made from recycling crop residues and manure. There is no soil erosion because all the plants keep the soil in place.)
- Provides pollination for a wide variety of plants. (There is a lot of food year-round for pollinators; nesting and roosting pollinator habitat includes trees, bamboo, and honeybee hives.)
- Controls insect pests. (There is plenty of habitat for insect pest controls such as natural vegetation for predatory insects; the garden has much plant diversity so populations of any one species of pest don't get too large; the garden has trees for nesting birds and roosting bats; natural plant repellents are planted among crops.)
- Does not produce waste. (Crop residues and manure go to compost; manure goes to the biodigester.)
- Does not need fertilizer. (Crop residues and manure are recycled as plant fertilizer; legume trees provide nitrogen.)
- Provides so much good, nutritious food. (The plants and animals have the fertile soil, food, pollination, and insect pest control they need to thrive.)
- Provides such a pleasant human habitat. (The garden is shady; no chemicals are required for fertilizer and pest control; there are many different plants and animals to observe and many flowers.)

23. Concentrated Chemicals

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objective: To learn how toxic chemicals are passed along through food chains (biomagnification)

Ages: Middle, older

Materials: Two different kinds of seeds (e.g., brown and white beans), eight per group; enough cups of various sizes—if you have them—to distribute to all of the kids

Time: 30 minutes

Procedure:

Begin by explaining the concepts of bioaccumulation and biomagnification:

- **Bioaccumulation:** The accumulation inside a living creature of a chemical that cannot be metabolized or excreted before more of it enters the organism. The substance is then stored in some body part, often fatty tissue or bones.
- **Biomagnification:** The sequence of processes in an ecosystem by which higher concentrations of a particular chemical, such as the pesticide DDT, are reached in organisms higher up the food chain
- Tell the kids they will now engage in an activity that demonstrates the process of biomagnification. Arrange your kids in pyramid fashion, replicating a food pyramid in which there are more living things at the bottom of the pyramid and the fewest at the top. Give them cups, if you have them, reflecting their position in the pyramid: For example, if you have 15 kids, give 5-ounce cups to eight kids, 8-ounce cups to four kids, 15-ounce cups to two kids, and a 1-quart container to one kid. If you do not have cups, you can do this activity without them.

Tell the students they will use the seeds (and cups) to show how a harmful chemical can concentrate in a food chain.

- The eight kids at the bottom of the food pyramid will represent aquatic plants.
- The four kids at the next level will represent aquatic insects.
- The two kids at the next level will represent fish.
- The kid at the top of the pyramid will represent a fish predator, such as a fish eagle, heron, or otter.

Give each of the eight kids at the bottom one of the two kinds of seeds (Seed 1 and Seed 2; e.g., brown and white beans). Explain to the kids that in this food chain, each insect eats two aquatic plants, each fish eats two insects, and the predator at the top eats two fish. The two kinds of seeds are digested and used by each member in the food pyramid, but one type biomagnifies. Before beginning, ask the kids what type of pollution one of the seeds might represent (e.g., pesticides or leaking toxic waste). Now proceed:

- Each aquatic insect receives four seeds from two aquatic plants (one of each from each plant).
- Each insect takes out one of Seed 1. Ask why. (This is food burned up as energy by the insect.)
- Why does the other Seed 1 remain? (It represents food stored, which helps the insect grow.)
- Each fish receives six seeds from two aquatic insects (one of Seed 1 and two of Seed 2 from each insect).
- Each fish takes away one of Seed 1. Review with the kids what this seed represents.
- The fish predator receives 10 seeds from the two fish (one of Seed 1, four of Seed 2). Why is one Seed 1 left? Why are there so many of Seed 2, and what do they represent? (Biomagnification of a harmful chemical.)
- What does the exercise represent? (Biomagnification.)

Wrap up the demonstration by asking the kids how people might be affected by the pollution in this food chain. (They could consume harmful chemicals by eating the fish.) Then ask, why is it important to use pesticides that break down in the environment? (Because pesticides can harm living things when they concentrate as they move up the food chain. After all, they are, by definition, poisons.)

24. Deer/Antelope Hunter

Adapted with permission from 101 Nature Activities, *by Sanborn Western Camps*

Objective: To demonstrate why some animals become prey more easily than others

Ages: Young, middle

Materials: None

Time: 30 minutes

Procedure:

This is basically a game of tag. One kid will be the hunter; the others will be deer. All deer will be divided up into different roles, each with a different handicap: mom and baby deer must always run together; crazy deer can only run backward; grandpa deer must walk; hurt deer can only use one foot; only dad deer can run regularly without a handicap. All deer start from a central place. When a deer is tagged, they must return to this location. Have kids switch roles periodically, and afterward, ask them which deer was hardest to tag. Conclude by asking them to explain what this game represents in the wild.

Variation:

Have kids suggest additional handicaps, and prepare yourself for the amusing ideas they come up with!

25. Ecosystem Musical Chairs

Contributed by Peace Corps/Jamaica

Objective: To see how living things can be connected in an ecosystem

Ages: Middle

Materials: Enough chairs for each kid, source of music (CD player, Volunteer with guitar, etc.), sheets of paper, marker, masking tape

Time: 30 minutes

Procedure:

This variation of the familiar game shows kids how the living things in an ecosystem can be connected to each other.

Prior to the game, compose a story that describes the destruction of an ecosystem in your country and the chain reaction it sets off among the living things that live there. See the example below, written by Danielle Pittner and Lynsey Sammons, Peace Corps Volunteers in Jamaica, to illustrate.

Set up chairs in a large circle and label each, using a piece of paper taped to it, as a character from the story. Choose an appropriate fast-paced song to play while the children dance around the circle of chairs. Make sure the music can be heard over the pandemonium! Have each kid stand in front of a chair. Explain that there is an important lesson in today's game and that they should pay very close attention to the story that will be read between each round. Tell them that every time the music plays, they must get up and dance around the circle until the music stops, at which point they must each find a chair to sit on. There will be one less chair than the number of students present in any given round.

Courtesy of PC/Mexico

If your story has an introduction, read it to the kids before starting the music (see example below). Now play music for any length of time you choose, then stop and read the first stanza of the story, which will remove one character from the ecosystem. Remove the chair of that character; the kid sitting in that chair must now exit the game. Proceed with playing music, stopping, reading the story lines, and removing a chair after each round. The kid left without a chair at the end of each round is out and must sit outside the circle. Move the chairs into a tighter circle as necessary. Of course, the last kid with a chair is the winner.

Story from Peace Corps/Jamaica
By Danielle Pittner and Linsey Sammons

Once upon a time there was an island called Jamaica.

The people there found bauxite, so the earth they began to break up.

They cleared away the trees to make room for all the mines.

Little did they know deforestation would bring bad times.

The first to fall were the white olive trees

Who would no longer feel the nice Jamaican breeze.

▶ Remove — White Olive Trees

Without the trees the parrots lost their homes.

Their magnificent colors no longer would be shown.

▶ Remove — Parrots

Without the parrots the snakes' bellies were no longer full.

They were hungry all the time, which just isn't cool.

▶ Remove — Yellow Snake

Without the yellow snake, the rat population grew and grew.

They chewed up the banana plants all the way through.

▶ Remove — Banana Plants

The banana plant wasn't alone; all the crops did suffer.

This made farming tougher and tougher.

▶ Remove — Farmers

Without the farmer's fruit the children were sad.

They had to get their potatoes out of a chip bag

▶ Remove — Children

▶ (Insert: See alternate ending for larger groups)

The chip bags they dropped all over the land.

They blew into the rivers where the fish swam.

The moral of this story is plain to see:

Damage done up top at the bottom will also be.

▶ Final chair remaining — Fish

▶ (Alternate Ending):

They just dropped their chip bags; they didn't think of it as litter.

Little did they know they'd end up in the river.

▶ Remove — River

With the river flowed the litter down into the sea,

Where the coral couldn't breathe because of all the debris.

▶ Remove — Coral

Oh, did the coral and the reef became sad,

'Cause all the fishies' homes were gone and that was real bad.

▶ Remove — Fish

The fish were no more and the nets were all empty.

Now there are none where once there was plenty.

The moral of this story is plain to see:

Damage done up top at the bottom will also be.

▶ Final chair remaining — Fishermen

Post-activity questions to consider

1. What does "ridge-to-reef" mean?
2. Did anything in the story surprise you?
3. What did you learn?
4. Did you like the game?

26. Ecosystem Web

Objective: To see how intricately interconnected living things can be in an ecosystem

Ages: Middle, older

Materials: Large pieces of paper or cardboard, tape, markers; or drawing, coloring, and painting implements; yarn (optional); wall paint for murals (optional)

Time: 20–30 minutes

Procedure:

In this activity, kids see the interconnections in ecosystems by diagramming them. Organize them into small teams of two to four, and distribute the materials you have chosen: drawing and coloring implements for diagrams, paint for wall murals, or yarn for connecting different components of the ecosystem. A tropical forest ecosystem example from Central America is provided here. Alternatively, you can use country-specific examples of your own.

Central American Tropical Forest Ecosystem Example:

Connections:

- A horde of army ants connects to:
- Insects that fly up from the ground to escape the marauding ants. The insects are connected to:
    - Antbirds that follow the army ants to snatch up the fleeing insects. Antbirds are connected to:
        - A butterfly that follows the army ants to find the antbirds so it can feed on its droppings and obtain vital nutrients. The butterfly is connected to:
            - A plant that contains a toxic chemical in its leaves. The butterfly eats the leaves and absorbs the toxin, thus becoming toxic and therefore protected against predators.
            - Another species of butterfly that looks like the toxic butterfly, but is not toxic, though predators think it is.
    - A spider that eats a fleeing insect that lands in its web. The spider is connected to:
        - A species of fly that lives on the spider's back and that steals scraps of food from the spider's web.
- A tree in which dwells a ...

Sloth, which connects to:

- Green algae that grow on its back, camouflaging the sloth from predators like eagles.
- Moths that live in the sloth's fur.
- The tree where the sloth lives and which provides the leaves the sloth eats. The tree is connected to:

- The sloth in a different way. The sloth climbs down from the tree once a week to defecate at its base, thus fertilizing the tree.
- Birds, such as blackbirds, called oropendolas that feed on its berries and in this way disperse its seeds. The oropendolas are connected to:
  - A *Hymanaea* tree where they build their nests in colonies. The *Hymanaea* tree produces seeds in closed pods that are very hard. The tree is connected to:
    - Bees that build their hive in the tree. The bees are connected to:
      - Trees with flowers that the bees pollinate.
    - Another species of blackbird, called a cacique, which also builds its nests colonially in the tree. The cacique is connected to:
      - The bees. The cacique builds its nest close to the hive of bees which protect it from predators.
    - A rodent called an agouti that finds the pods when they fall to the ground and that gnaws a hole in them to get at the seeds. The agouti buries seeds it doesn't eat. The seeds it forgets about germinate to become new *Hymanaea* trees. The agouti is connected to:
      - A small mouse that steals some of the seeds, but cannot open the pods, so it relies on the agouti to open them. The mouse is connected to:
        - A small cat, called an ocelot, that eats the mouse.
    - Wild pigs called peccaries that gnaw holes in the pods to get at the seeds. The pigs are connected to:
      - Frogs that breed in pools of water that form in peccary wallows. The frogs are connected to:
        - Insects that they eat.
      - Jaguars that eat peccaries.
    - A large rodent called a paca that eats *Hymanaea* seedlings. The paca is connected to:
      - The agouti that buried the seed that germinated into the seedling.

27. Food Web Demonstration

Objective: To learn the concept of food webs in nature

Ages: Young, middle

Materials: Ball of yarn or string, paper, writing utensil, tape

Time: 20–30 minutes

Procedure:

This is a popular demonstration of food webs that can be carried out in different ways. Here's one:

Before gathering the kids, write on sheets of paper, in letters large enough to read from several feet away, the names of different plants and animals that live in your area. Try to include the following:

- A plant, ideally one that produces fruit like a berry, that is pollinated by bees or other insects
- A plant that produces fruit
- An insect such as a grasshopper
- An animal that eats insects, such as a frog or bird
- An animal that eats plants, like a mouse
- An animal that eats mice
- Animals that eat a variety of plant and animal foods, such as foxes, monkeys, skunks, etc.
- A farmer
- The sun

Gather the kids, give each one a sheet with the name of a plant or an animal or "farmer" or "sun" on it, and ask them to tape the sheets to themselves so people can read them. Arrange the kids in a circle with the "sun" in the center and tell them that they represent a community in a patch of natural habitat situated next to the farmer's field. Give the sun the ball of yarn. Ask the kids which living thing gets its energy directly from the sun and, when they get the answer, ask the sun to toss the ball of yarn to the plant, while still holding onto a strand. The kids should now discuss which creatures are connected to the plant. According to their ideas, the plant then tosses the ball of yarn, while holding onto a strand, to each creature that eats it or its fruit or that pollinates it. So, for example, if the plant tosses the yarn to a honeybee, the honeybee catches the ball and, holding onto a yarn strand, tosses the ball back to the plant, which will then toss it to a mouse that eats its fruit. If this wraps up all of the animals that eat or pollinate the plant, the mouse would then repeat the process by tossing the ball of yarn to all of the creatures that eat it; they, in turn, would do the same. When finished, many of the creatures—especially the ones that eat both plants and meat—and the farmer will be holding several strands of yarn connecting them to the others in multiple ways. Ask the circle to expand until the yarn strands that each kid is holding are taut.

Now tell the group that the farmer has sprayed pesticide on his or her field, and the breeze has blown it into the habitat. What will be the first creatures affected? (The insects.) Ask the insects to tug their strands and the rest of the kids to tell if they feel the vibrations. This shows them how they are connected to the insects, both directly and indirectly. Now ask the insects to drop their strands (because they're dead), and then ask the insect eaters to do the same. If you have a plant that is pollinated by bees, ask the plant, in turn, to drop its strands. The plant eaters follow, then the meat eaters, and ultimately the creatures that eat both plants and

meat. Wrap up the exercise by asking what impact the disappearance of an animal can have on a food web.

1. What happens when we remove a link in the forest ecosystem? (Organisms that depend on it are affected.)
2. Were the changes more dramatic when the system was composed of many parts or when it had fewer parts? (When it had fewer parts.)
3. What can we say about the relationship between how many parts the system has (its complexity or diversity) and how stable it is? (In general, complexity makes a system more stable.)

28. Migration Mania Game

Contributed by Peace Corps/Jamaica

Objective: To show the hazards migratory birds face

Ages: Young, middle

Materials: Plastic bottles, sticks, or stones

Time: 20 minutes

Procedure:

Prior to the game, establish a starting line and a finish line. Place a number of rocks, bottles (plastic, for safety reasons), or sticks equal to the number of kids on the finish line. Line up the kids along the starting line and explain to them that many birds "migrate" to your country during the winter from North America, Europe, Russia, etc. (use whichever geographic region applies to you), but that they have a lot of obstacles to overcome.

Now narrate a bird migration story in which a flock of birds encounters a succession of hazards. For example, "You leave New York with your flock, but three of you can't find enough food for the long journey." Once you do that, take away three bottles at the finish line. The kids now run, collect a bottle (or stick, etc.) and return to the start. The kids without a bottle are dead; encourage them to ham it up as they expire. Keep giving scenarios until there is one survivor. Examples: The birds run into glass buildings, buildings lit up at night, a big storm or even a hurricane, feral cats, hunters, and reduced wintering habitat due to deforestation or drought. Some can get lost. Once the game is over, ask the kids what people can do to help migratory birds survive and why people must work together across nations to ensure the birds' survival.

29. Mutualism and Commensalism

Objective: To illustrate mutualism and commensalism in nature

Ages: Middle, older

Materials: Paper, scissors, writing utensils, worksheet; crayons or other art supplies optional

Time: 30–45 minutes

Procedure:

This is an active game that teaches kids about symbiotic relationships found in nature. It illustrates some of the many ways in which living things are connected to each other and why, when humans alter the environment, unforeseen ecological chain reactions occur.

Prior to the game, make sure your kids know about the symbiotic relationships of mutualism and commensalism. (Mutualism is when two or more organisms form a partnership in which each one benefits; commensalism is when one organism benefits from the relationship and the other isn't affected one way or another.) Don't worry if the kids have a hard time memorizing these terms; it's only important that they understand the concepts. Ask them if they know of any examples.

Write on slips of paper the name of a living thing and what it wants or does. Each description will have a partner description on another slip of paper. (E.g., Slip A: I'm a tickbird in Africa. I want a large animal that is infested with ticks so I can climb on top of it and eat them. Slip B: I'm a rhinoceros in Africa. I want an animal to get these ticks off me.) Pairings can be found on the accompanying information sheet. You can also add an M or a C to the paper slips, to tip off the kids that they will be looking for either a mutualistic or a commensalistic relationship. Make enough slips of paper so each kid will have several.

Now distribute the slips of paper to the kids so that they each have the same number. Ask the kids to go around the room to find the partner descriptions for each of their descriptions. Whenever two partners find each other, they run to you to check their answers. Using the information sheet, you can tell them whether they are correct or not; if they are, give each kid a point. The first kid who is able to match all of his or her descriptions wins. As a follow-up, the kids can work together to draw pictures of their relationships and post them in an exhibit.

Symbiosis Information Sheet

Pair #1:

- **A.** I'm a flower. I need an animal to carry pollen from me to another flower so we can reproduce. (M)
- **B.** I'm a bee. I need sources of pollen to feed my larvae. (M)

Pair #2:

- **A.** I'm a tickbird in Africa. I want a large animal that is infested with ticks so I can climb on top of it and eat them. (M)
- **B.** I'm a rhinoceros in Africa. I want an animal to get these ticks off me. (M)

Pair #3:

- **A.** I'm a woodpecker that makes holes in trees in which to lay eggs and raise young. (C)
- **B.** I'm a bird that nests in tree cavities, but I can't make them myself. (C)

Pair #4:

- **A.** I'm a lion/jaguar/tiger that kills and eats large animals. (C)
- **B.** I'm a vulture that eats the remains of dead animals. (C)

Pair #5:

A. I'm a large fish that has small parasites living on me that I want to get rid of. (M)

B. I'm a small fish that eats small creatures off the scales of other fish. (M)

Pair #6:

A. I'm a plant (epiphyte) that grows on the branches of tall trees and that forms a small pool of water. (C)

B. I'm a frog that lays its eggs in small pools of water made by plants that grow on tree branches. (C)

Pair #7:

A. I'm a giant polar bear that roams the Arctic ice looking for seals to eat. (C)

B. I'm an Arctic fox that tries to find the remains of dead animals to eat in the dead of winter when everything is covered with snow and ice. (C)

Pair #8:

A. I'm a tree that puts its seeds in berries that need to get spread around away from me. (M)

B. I'm a bird that eats berries and then flies away. (M)

Pair #9:

A. I'm a snail that lives in shells that I replace as I get larger. (C)

B. I'm a hermit crab that lives in snail shells that the snails no longer use. (C)

Pair #10:

A. I'm a tiny insect called an aphid that sucks plant juices and produces a sweet liquid as a waste product, and that is often eaten by other insects. (M)

B. I'm an ant that drinks sweet liquids and defends its food sources with bites and stings. (M)

Pair #11:

A. I'm a snake that sheds its skin periodically. (C)

B. I'm a bird that uses snake skins to put into my nest. (C)

Pair #12:

A. I'm a ground squirrel that makes burrows in the ground to live in. (C)

B. I'm an owl that lives in holes in the ground. (C)

Pair #13:

A. I'm a coral animal that builds reefs. (C)

B. I'm a fish that lives in holes and nooks in coral reefs. (C)

Pair #14:

A. I'm a cow that kicks up insects when I walk through the grass. (C)

B. I'm a bird that eats insects that hide in grass, and it's hard to find them. (C)

Pair #15:

A. I'm a person that likes to eat honey, but it's a lot easier if I have a guide to show me where the hives are. (M)

B. I'm a honeyguide bird that eats beeswax and bee larvae, but needs help in breaking into the hives. (M)

Pair #16:

A. I'm a tree that is bothered by caterpillars that eat my leaves. (M)

B. I'm a wasp that kills caterpillars to feed my young. (M)

Pair #17:

A. I'm an acacia tree that wants aggressive ants to protect my leaves from insects and other animals that eat them. (M)

B. I'm an ant that eats nectar and lives in hollow thorns, both provided by acacia trees. (M)

30. Pollination Brain Teasers

Objective: To learn that flowers are designed to be pollinated by specific pollinators

Ages: Middle

Materials: Flip chart paper, chalkboard and chalk, or paper; drawing and painting supplies: e.g., paper, brushes, markers, crayons

Time: 20–30 minutes

Procedure:

This activity teaches kids that flowers differ so much in size, shape, color, scent, blooming season, and position on the plant because they are designed to attract specific pollinators. Honeybees, as proficient as they are in pollinating, can't do it all. Thus, it is essential to preserve insect and animal diversity in order to maintain plant diversity.

On a piece of flip chart paper, or on separate sheets of paper, write down an animal and its characteristics:

Hummingbird (Central and South America) or sunbird (Africa and Asia)

- Sees the same colors that people see, especially red
- Has long, thin bill
- Has no sense of smell

Bumblebee

- Does not see red; does see ultraviolet
- Has acute sense of smell
- Likes nectar (sweet liquid produced by some flowers) and pollen
- Is large and sturdy

Fly or carrion beetle

- Has acute sense of smell
- Feeds on animal waste and dead animals, where it lays eggs

Moth

- Flies at night
- Mouth is a long tube, like a soda straw, which is curled up when not in use
- Does not have moveable jaws
- Likes nectar (sweet liquid produced by some flowers)
- Has acute sense of smell

Bat

- Flies at night
- Is color-blind
- Likes nectar and pollen
- Has good sense of smell

Wind

- Doesn't see, smell, or eat!

Male bee

- Primary goal is to find a female and mate with her
- Eats pollen and nectar
- Acute sense of smell

Once you have written these descriptions down, ask the kids, either individually or in pairs, to design a flower that would attract each one of these. If you have art supplies handy, the kids can draw the flowers; otherwise, they can simply write down what the flowers should look like. Once the kids are done, ask one of them to share their creation, then ask if any kids would like to offer a revised version. After everyone has had a chance to speak, share with the kids the typical creation that nature has come up with. Then repeat the process with a different kid and a different animal. During this discussion, if you have an example of the flower or a photo with which you can illustrate the different flower types, that will be helpful, but it is not necessary. The typical flower designs are:

For hummingbird or sunbird:

Red, tubular in shape, no scent

For bumblebee:

Sturdy, often with door-like structure that bee has to push to gain access to pollen and nectar, various colors except red, sweet-smelling

For fly or carrion beetle:

Maroon or reddish-brown in color, foul smelling (The insects are fooled into thinking the flower is a dead animal or a piece of animal waste!)

For moth:

Blooms at night, white, sweet-smelling, tubular in shape

For bat:

White, blooms at night, situated at end of branch, large and sturdy, sweet-smelling

For wind:

Random color (typically green or brown), small or nonexistent petals, no scent, exposed to air, typically produces a lot of pollen because the likelihood of a pollen grain landing on the right part of a flower to fertilize it is very small.

For male bee:

Some flowers actually mimic the shape and smell of female bees, and the males try to mate with them, inadvertently picking up pollen in the process!

Some flowers actually provide a “cologne” that the male bees gather to attract females!

Discussion Questions:

1. Why is it important to keep a diversity of insects and other animals around if we want to have a diversity of flowers?
2. Do you think all fruit tree and vegetable flowers look and smell alike? If not, do you think it’s a good idea to have a diversity of insects and other animals around besides honeybees?
3. Does anyone have hay fever or allergies to pollen? Which kinds of flowers do you think cause these allergies? (Flowers with wind-borne pollens; the others don’t produce pollen that blows around.)

You can also take the kids around the neighborhood to find different flowers and discuss what probably pollinates them. This can include the flowers of fruit and vegetable crops. Note the specific insects and other animals you see visiting the flowers. (Not all of them will be pollinating.)

Variation:

After this introduction to flower design and pollination, take the kids into the community fields and orchards to find fruit, vegetable, and grain flowers. Discuss what probably pollinates them, noting the insects and other animals you see on them (aside from the grain and grass flowers, which will be pollinated by wind). Might any other animals be pollinating these crops besides honeybees? Local farmers and agricultural extension agents may be able to provide some answers.

31. Pollinator Mobile

Contributed by Peace Corps/Mexico

Objective: To illustrate the role pollinators play in pollinating flowers

Ages: Young

Materials: Paper, scissors for cutting out animal (etc.) pictures, wire, colored pencils, markers, tape, glue, pliers (optional)

Time: 1 hour

Process:

Start by asking students which animals are considered pollinators: Bees, butterflies, and hummingbirds are the most prominent examples; yet some species of ants, wasps, beetles, moths, lizards, and even monkeys can also pollinate. Pose questions about the pollination process and the important role of these animals.

To make a pollinator mobile, the first step is to construct an X-shaped cross from which the various paper animals will hang. This cross can be made from wire, sticks, or wood.

Courtesy of PC/Mexico

Then students should create and color different species of pollinators. If possible, print out the silhouettes of these species prior to the session so students can trace and cut out the animal shapes. Students should color in both sides of the pollinator. Hang the pollinators by attaching their backs/wings to string and tying the other end to the cross above.

Finally, be sure to draw a giant, colorful paper flower that hangs between all of the pollinators.

Variation:

Instead of pollinators, adapt this activity to other concepts and themes, including the solar system, fruit, or marine life mobiles.

32. Pyramid of Life

Adapted from Sharing Nature With Children

Objective: To become aware that the sun's energy moves through food chains

Ages: Young, middle

Materials: Paper, writing utensils

Time: 20 minutes

Procedure:

Begin by giving the kids each a slip of paper and asking them to write on it the name of a local plant or animal. Ask: From what source does the Earth get its energy? From the sun, right! What form of life is the first to make use of that energy? Plants! Right again!

Next, explain that you are going to build a pyramid. All the kids who have chosen to be plants will get on all fours. And because animals depend on plants directly or indirectly for food, they will go on top of the plants. Next, read off all of the animals that are plant eaters, and ask them to line up behind the plants, followed by the meat eaters behind them. Due to uneven numbers, it may be necessary for some kids to become plants or plant eaters. Larger kids can also become plants, if necessary, to build a stronger, more stable pyramid. Have the kids pile on top of each other in the correct order to form a food pyramid.

At some point after the pyramid has been built, you can reinforce the importance of plants by asking what would happen if one of the plants were removed. Challenge the kids to construct their best pyramid themselves.

Courtesy of PC/Mexico

33. Recipe for a Forest

Adapted from Sharing Nature With Children

Objective: To gain awareness of the beauty of nature and the natural processes that maintain it

Ages: Young, middle

Materials: Large pieces of paper or reused cardboard; drawing, coloring, and/or painting materials

Time: 30–60 minutes

Procedure:

In this simple exercise, kids create their own dream forests, complete with as many trees, animals, mountains, waterfalls, rivers, and even rainbows as they want. Tell them they each have the deed to one square kilometer of land, and encourage them to be creative. Once they have completed their creations, discuss with them, according to their respective ages, whether their individual plots can maintain themselves year after year. For example, are there enough plant eaters for the predators, and are there enough predators to keep the plant eaters from eating all the plants? Are there decomposers to eat the dead animals and recycle their nutrients back into the forest? What will be needed to keep the water clean and flowing, the soil fertile, and the air clean?

34. Seed Dispersal Exhibit

Objective: To learn how seeds in different types of fruit are dispersed

Ages: Young, middle

Materials: Various types of seeds; tape, glue, or staples; string, tacks, index cards, marker

Time: 20 minutes

Procedure:

Seed dispersal is among the most significant ecological services that animals provide. Birds, rodents, hoofed animals, bats, and even ants eat different kinds of fruit and, in so doing, inadvertently carry the seeds of the fruits away from their parent plants and deposit them where they can germinate. Other seeds are dispersed by wind, and a few are dispersed by water. You can teach kids about this critical process with a brain-teaser activity. Collect as many different types of wild fruit as you can, examples being:

- **"Parachutes," "helicopters," grass seeds:** wind-dispersed
- **Berries:** typically bird-dispersed; also dispersed by other animals depending on the plant
- **Larger fruits:** bats, monkeys, hoofed animals (African sausage tree fruits can be dispersed by elephants!)
- **Burs:** Stick to hairy animals (and people's clothes!)

- **Nuts:** Buried by squirrels and other rodents
- **Small, hard seeds with attached nutrient packets (elaiosomes):** ant-dispersed; the ants take the seeds underground, eat the attached nutrient packets, and discard the seeds.
- **Coconuts, mangrove fruits:** saltwater dispersed

Once you have collected the fruits, fasten them with tape, glue, staples, or pins to a bulletin board or wall. On index cards or paper, write down the disperser of the fruit (e.g., "bat," "wind," "bird"). Fasten these to the bulletin board as well. Attach to each label a piece of string with a tack on the other end. Kids who visit the display try to match the dispersal mechanism to the fruit(s) it disperses by tacking the string next to the appropriate seed.

As a follow-up discussion, ask your kids to imagine coming across a tree in the forest with its large fruit piled up in a rotting pile at the base of the trunk. What would this indicate? (The disperser is no longer present.) If the disperser never comes back, what will happen to the tree? (When it dies, the species will vanish because no offspring are taking its place.) Why, therefore, is it important to preserve populations of animals—even ants—that we might not appreciate otherwise?

35. Seed Race

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objective: To learn how plants disperse their seeds through the air using wind power

Ages: Young, middle

Materials: Markers in multiple colors and a variety of wind-dispersed seeds

Time: 30 minutes

Procedure:

This activity is a team-based race. Before the race begins, collect wind-dispersed seeds (or take the kids out to do so). If you can find only one type of seed, that's OK.

Divide the kids into pairs, and ask each pair to pick out a variety of seeds from the pile (or several of one type of seed). Also have each team choose a different color magic marker and mark their seeds. From a high place such as a tree stump, hill, or embankment, ask each team, in turn, to release their seeds into the air. They can just fling them, or find any other way to release them from a standing position. (A windy day will make this activity lively!) Enlist the other kids to help track and find the seeds where they land. The team whose seeds traveled the farthest is the winner. (Note: This activity works best in an open area because the seeds need to be exposed to the wind, and you need to be able to track the seeds.) Follow up by asking the kids:

1. Why do some plants produce seeds that can be carried so easily by the wind?
2. Why do many of these plants produce great numbers of seeds? (The chances that they will land in suitable places for germination are very small.)

3. Why do some plants produce berries and other fruits in which their seeds reside? (They are dispersed by birds and other animals, which eat the fruits and release the undigested seeds in their wastes—which act as fertilizer.)

Variation:

If you have a supply of seeds that have "parachutes" (like dandelion or milkweed seeds in the United States, for example), you can hold a different kind of race. Establish a starting line and finish line. Have each kid take a seed in his or her hand. When the race starts, each kid should blow the seed into the air and continue blowing it down to the finish line. If the seed drops, of course, the kids can pick it up and continue. This race can be done individually or in teams of two. To make it even more challenging, make it a relay race! Or to make it simpler, simply time how long kids can keep their "parachutes" in the air by blowing them.

36. Transects and Quadrats

Contributed by Peace Corps/Paraguay

Objectives: To census biodiversity and to compare it between different ecosystems

Ages: Middle, older

Materials: Stakes or sticks, string, writing paper and utensils

Time: 30–60 minutes

Procedure:

In transect surveys, kids stretch a string across a piece of ground, stake each end, and count the living things that are either underneath the string or within arm's length of it. In quadrat surveys, kids map out a square piece of ground and survey the living things lying within the square.

For transect studies of trees and shrubs, the kids would use a piece of string perhaps 5–10 yards long, depending on how dense the plant growth is, and survey all the items within arm's length of the string. For finding small creatures and herbs, the kids can use a piece of string perhaps 1 yard long (a mini-transect) and count everything underneath it. Or they can map out a square 3 feet by 3 feet, get down on their knees, and count everything lying within. These can be great ways for kids to discover a whole new world of living things that they didn't know existed. In tallying their results on a piece of paper, kids will probably not know the names of the trees, herbs, insects, and other living things they encounter. Instead, they can come up with simple descriptions: e.g., two little yellow flowers, three black beetles, and two clumps of moss.

Transect and quadrat studies can reveal the differences in varied habitats. Have the kids compare the life found in such environments as grasslands, eroded landscapes, patches of forest, streamsides, and backyards. After the kids are finished, gather them together and tally their results on a blackboard or flip chart paper.

Discussion Questions:

1. Which ecosystem had the most plant diversity and which had the least? What might explain these results? (E.g., grazing, livestock compacting soil, moisture, human foot traffic.)
2. How do human-modified or livestock-modified ecosystems compare with non-modified examples?
3. What do you think we could do to protect and increase biodiversity in these ecosystems?

Courtesy of PC/Nicaragua

Food Security Activities

Food Security Activities

37. Are You Food Secure?

Contributed by Peace Corps/Togo

Objective: To learn some of the food security issues in your community

Ages: Middle, older

Materials: Paper, writing implements

Time: One hour to several days, depending on the number of households interviewed

Procedure:

Middle and older kids can carry out this simple survey to learn some of the food security issues confronting their communities. It was developed by Peace Corps/Togo; revise according to your country's situation.

Note: Be sure that it is culturally appropriate for kids to conduct community surveys. In some places, such activity is viewed with deep suspicion, for a variety of reasons. Check with your program manager or host country counterpart to be sure. If you are unsure, consider conducting the survey yourself with people whose trust you have gained and then sharing the results with your youth group.

Survey

Number of people eating in the family every day. (Of the families you know, how many would you say have at least one person who does not eat at least one meal in a day?)

Adults: Children:

1. After the harvest, do (you, local people) typically store food? If yes, what and how?
2. If the food stored each year is not enough for a family, how might they still find food?
3. (You, a typical family) might eat the following things how many times a week? Fish, meat, vegetables.
4. Do (you, local people) talk about problems/difficulties with agriculture? What are the problems? What is the cause?
5. Do (you, most families) have a family garden at home? What do (you, they) typically grow?
6. Do you know about Moringa? Do people grow it here? If so, how do (you, people) use Moringa?

Discussion Question:

How can you use this information to create a food security project in your community? (By identifying the reasons why people are food insecure, your kids can better decide the kind of projects to implement to address these problems.)

38. Food Security Game

Contributed by Peace Corps/Togo

Objective: To teach some fundamental concepts about food security

Ages: Middle, older

Materials: Index cards or pieces of paper, scissors, writing utensil

Time: 20 minutes

Procedure:

This game shows kids some of the factors that determine how food-secure people are. It was developed by Peace Corps/Togo; revise according to your country situation.

Prior to the start, copy the following card texts onto separate index cards or pieces of paper, or send the pages below through a copier and then cut with scissors. Laminating will enable you to use the cards repeatedly.

Sex	Male	**Sex**	Female
Age	8	**Age**	8
Primary Work	Student	**Primary Work**	Student
Secondary Work	Trader of agricultural products	**Secondary Work**	Trader of agricultural products
Education Level	CP2	**Education Level**	CP1
Number of Children	0	**Number of Children**	0
Green Techniques	None	**Green Techniques**	Composting
Illness	Blind	**Illness**	None
Other	Orphan, doesn't speak native language	**Other**	Orphan

Sex	Male	**Sex**	Female
Age	13	**Age**	13
Primary Work	Student	**Primary Work**	Apprentice
Secondary Work	Tree processor	**Secondary Work**	Gardener
Education Level	CM1	**Education Level**	CM1
Number of Children	0	**Number of Children**	0
Green Techniques	None	**Green Techniques**	Composting
Illness	HIV/AIDS positive	**Illness**	HIV/AIDS positive
Other	Member of an agriculture co-op	**Other**	Doesn't speak native language

Sex	Male	**Sex**	Female
Age	22	**Age**	22
Primary Work	Gardener	**Primary Work**	Housewife
Secondary Work	Mushroom grower	**Secondary Work**	Trader of agricultural products
Education Level	Primary	**Education Level**	Ninth grade
Number of Children	0	**Number of Children**	1
Green Techniques	Composting, alley farming	**Green Techniques**	None
Illness	None	**Illness**	Blind
Other	Owner of a well-groomed field	**Other**	Member of an agriculture co-op

Sex	Male	**Sex**	Female
Age	45	**Age**	45
Primary Work	Teacher	**Primary Work**	Housewife
Secondary Work	Pig breeder	**Secondary Work**	Trader of agricultural products
Education Level	University	**Education Level**	Sixth grade
Number of Children	5	**Number of Children**	6
Green Techniques	Composting	**Green Techniques**	None
Illness	None	**Illness**	None
Other	Handles livestock	**Other**	Doesn't speak native language

Sex	Male	**Sex**	Female
Age	80	**Age**	80
Primary Work	Trader of agricultural products	**Primary Work**	Housewife
Secondary Work	Farmer	**Secondary Work**	Gardener
Education Level	None	**Education Level**	None
Number of Children	7	**Number of Children**	4
Green Techniques	Composting	**Green Techniques**	Composting
Illness	Deaf	**Illness**	Deaf
Other	Illiterate, owner of a field, doesn't speak native language	**Other**	Illiterate, doesn't speak native language

Sex	Male	**Sex**	Female
Age	9	**Age**	9
Primary Work	Student	**Primary Work**	Student
Secondary Work	Animal hunter	**Secondary Work**	Farmer
Education Level	CP2	**Education Level**	CP1
Number of Children	0	**Number of Children**	0
Green Techniques	None	**Green Techniques**	Green fertilizer
Illness	None	**Illness**	Leg amputee
Other	Doesn't speak native language	**Other**	Burns field after harvest

Sex	Male	**Sex**	Female
Age	15	**Age**	15
Primary Work	Apprentice	**Primary Work**	Apprentice
Secondary Work	Animal hunter	**Secondary Work**	Converter of agricultural products
Education Level	CM1	**Education Level**	CM1
Number of Children	0	**Number of Children**	1
Green Techniques	None	**Green Techniques**	Natural insecticide
Illness	HIV/AIDS positive	**Illness**	None
Other	Doesn't speak native language	**Other**	Member of an agriculture co-op

Sex	Male	**Sex**	Female
Age	25	**Age**	25
Primary Work	Teacher	**Primary Work**	Converter of agricultural products
Secondary Work	Pig breeder	**Secondary Work**	Mushroom farmer
Education Level	University	**Education Level**	Ninth grade
Number of Children	2	**Number of Children**	3
Green Techniques	Composting	**Green Techniques**	Green fertilizer, natural insecticide
Illness	Finger amputee	**Illness**	None
Other	Handles livestock	**Other**	Handles livestock

Sex	Male	Sex	Female
Age	49	Age	49
Primary Work	Electrician	Primary Work	Housewife
Secondary Work	Tree processor	Secondary Work	Farmer
Education Level	10th grade	Education Level	CM2
Number of Children	4	Number of Children	2
Green Techniques	Alley farming	Green Techniques	Alley farming
Illness	None	Illness	None
Other	Owner of a well-groomed field	Other	Illiterate, burns field after harvest

Sex	Male	**Sex**	Female
Age	77	**Age**	77
Primary Work	Farmer	**Primary Work**	Housewife
Secondary Work	None	**Secondary Work**	Farmer
Education Level	None	**Education Level**	None
Number of Children	6	**Number of Children**	6
Green Techniques	Alley farming	**Green Techniques**	Green fertilizer
Illness	None	**Illness**	None
Other	Illiterate, owner of a well-groomed field	**Other**	Illiterate, doesn't speak native language

Sex	Male	**Sex**	Female
Age	3	**Age**	3
Primary Work	None	**Primary Work**	None
Secondary Work	None	**Secondary Work**	None
Education Level	None	**Education Level**	None
Number of Children	0	**Number of Children**	0
Green Techniques	None	**Green Techniques**	None
Illness	None	**Illness**	None
Other	Orphan	**Other**	None

Sex	Male	**Sex**	Female
Age	17	**Age**	17
Primary Work	Student	**Primary Work**	Student
Secondary Work	Peach grower	**Secondary Work**	Converter of agricultural products
Education Level	CM1	**Education Level**	CM1
Number of Children	0	**Number of Children**	1
Green Techniques	Green fertilizer	**Green Techniques**	Green fertilizer
Illness	None	**Illness**	HIV/AIDS positive
Other	Handles livestock	**Other**	Member of an agriculture co-op

Sex	Male	**Sex**	Female
Age	21	**Age**	21
Primary Work	Pig breeder	**Primary Work**	Post office employee
Secondary Work	Driver	**Secondary Work**	Converter of agricultural products
Education Level	Primary school	**Education Level**	University
Number of Children	0	**Number of Children**	2
Green Techniques	None	**Green Techniques**	None
Illness	None	**Illness**	None
Other	Member of an agriculture co-op	**Other**	Handles livestock

Sex	Male	**Sex**	Female
Age	41	**Age**	41
Primary Work	Driver	**Primary Work**	Housewife
Secondary Work	Gardener	**Secondary Work**	Peach grower
Education Level	10th grade	**Education Level**	Sixth grade
Number of Children	2	**Number of Children**	5
Green Techniques	Natural insecticide	**Green Techniques**	None
Illness	None	**Illness**	None
Other	Owner of a well-groomed field	**Other**	Handles livestock

Sex	Male	**Sex**	Female
Age	67	**Age**	67
Primary Work	Converter of agricultural products	**Primary Work**	Housewife
Secondary Work	Farmer	**Secondary Work**	Farmer
Education Level	None	**Education Level**	None
Number of Children	3	**Number of Children**	9
Green Techniques	Natural insecticide	**Green Techniques**	Green fertilizer
Illness	Deaf	**Illness**	None
Other	Illiterate, burns field after harvest	**Other**	Illiterate, doesn't speak the native language

Distribute a card to each kid, and ask them all to line up. Each kid reads the card they were given and then assumes that identity for the game. Now the leader of the game should read each of the sentences below (or revised sentences that you have written). After reading each sentence, each participant must take a step forward or backward, depending on who that person happens to be.

Sentence Examples:

1. If you are female, take a step back.
2. If you are under 18 or over 70 years, take a step back.
3. If your job gives you a fixed salary—for example, teaching or serving as a state employee—step forward.
4. If you are a gardener or farmer and you are using green technology, move a step forward.
5. If you are a gardener or farmer and you burn the field after the harvest, take a step back.
6. If your level of education is less than second grade, take a step back.
7. If you have children, move a step forward.
8. If you have more than three children, take a step back.
9. If you are infected with HIV/AIDS, take a step back.
10. If you do not have a disability or disease, advance a step.
11. If you do not speak your country's native administrative language, take a step back.
12. If you do farming, move a step ahead.
13. If you hunt animals, take a step back.

14. If you are a member of an agricultural cooperative, move a step forward.
15. If you do an activity associated with Moringa or mushrooms, move a step forward.
16. If you are illiterate, take a step back.
17. If you are the owner of your field, move a step ahead.
18. If you are an orphan, take a step back.
19. If you do not do any agriculture, take a step back.

Discussion Questions:

1. What did you notice during this activity?
2. After this exercise, can you better explain food security to your neighbors? Why or why not?
3. What are the things you can do to improve the level of food security in your family, community, country? (Developing new ways of generating income, increasing food production for home use, improving nutrition, improving farmer business skills, increasing literacy, improving girls' education, etc.)
4. Why do you think that one's level of education and ability to read, speak, and write their country's national administrative language are important for food security? (These can increase people's chances of obtaining good-paying jobs, which can enable them to purchase ample food and pay for their children's education. Also, ability to read can provide access to information that can help people make sound decisions about a range of food security–related issues: e.g., making healthy food choices, maintaining the health of their family, making good decisions in their personal and professional lives.)
5. How do diseases and disabilities contribute toward food insecurity? (Unhealthy people cannot work to the best of their ability; thus, their income suffers. Often, sick people cannot hold food down and become malnourished.)
6. The first statement was that all women should take a step back. Why do you think this was the case? (Opportunities for education and, therefore, for developing skills for generating income are often fewer for women. Women often do not obtain the nourishment in their diets that men do.)

39. Finding the Organic Solution

Contributed by Peace Corps/Dominican Republic

Objective: To learn organic solutions to common agricultural problems

Ages: Middle, older

Materials: Pens/pencils, paper with the three problems and three solutions below written on separate pieces

Time: 20 minutes

Procedure:

In this exercise, kids encounter scenarios describing some agricultural problems and decide what organic solutions they could implement to confront them.

Form groups of kids, and give each a sheet of paper with one of the problems or solutions written on it. Each group should read its paper aloud and then find another group that has the problem or the solution that corresponds. The correct pairs can sit down together, and, after taking five minutes to prepare, each pair describes its particular problem and why the organic solution effectively addresses it. After all three presentations, the entire group can discuss what it might do, as a community service project, to encourage people to implement these solutions.

The following scenarios come from Peace Corps/Dominican Republic; revise according to your country's issues.

Problem 1: Juan had eggplants and peppers with an infestation of harmful insects. When he sprayed pesticides, he noticed that bees that normally helped pollinate his vegetables were dead. Some harmful insects, on the other hand, survived because they were pesticide resistant. Apparently, when they continued to reproduce, the young insects inherited this resistance to the pesticide. Now, Juan has to spray twice the amount of pesticide as previously in order to get the same results, but he is seeing fewer vegetables because fewer pollinating insects are around. What could he have done differently?

Problem 2: Pedro has a natural pond on his farm. Juan put fertilizer around his plants to help them grow faster. The crop looks pretty, but does not have the same great taste as before because the plants are receiving different nutrients. When it rains, the pond is filled with the fertilizer that is draining off of his plants. The pond is filled with algae that grow very fast and remove valuable oxygen from the water, thus suffocating fish and other aquatic creatures. Now only algae grow in the lagoon, and no one can fish there anymore. What could he have done differently?

Problem 3: Aminata has been spraying her farm with herbicides to kill weeds. The herbicide trickles into the underground water and enters the groundwater reservoir. When Aminata and her family drink water from their well, they get sick from the herbicide. What could be done differently?

Solution 1: Could plant plants that attract insects that like to eat other insects that may be harmful to garden plants. Could learn to make natural pesticides.

Solution 2: Could collect organic solid waste from agriculture activities and animals (manure) to make compost piles. As a result, there would be many fish in the clear water of the pond, and the harvest would be better!

Solution 3: Could weed by hand and cover the land with organic litter such as cut grass, dry leaves, and pieces of cardboard, which hinder weed growth and leave plants and soil contaminant free.

40. Making Natural Pest Controls

Compiled from contributions from Peace Corps/Cameroon, Peace Corps/Dominican Republic, and Peace Corps/Togo

Objective: To learn how to make natural biopesticides to use instead of more toxic commercial chemical pesticides

Ages: Middle, older

Materials: Depends on pesticide being prepared: Hot peppers, tomato leaves, neem leaves, garlic, onions, mint, tobacco, lemons, limes, wood ash, water, non-chemical soap, strainer, utensils for cutting and crushing peppers and neem leaves, knife for cutting soap. See below for individual pesticide instructions.

Time: 30 minutes, not counting overnight time needed to soak plants and soap

Procedure:

These are simple recipes for effective natural pesticides. Applied to gardens, they can replace toxic, commercial brands that can produce harmful health and environmental side effects. These pest controls must be applied at least once a week, and twice if it rains.

Your kids can make the pesticides while gathered in a group, and apply the finished products to gardens at home or at school. They can also bottle and sell them at community events and fundraisers.

These recipes come from the Peace Corps Gardens Training Package:

Hot Pepper Solution

A general repellent, it is effective for caterpillars, cabbage worms, ants, aphids, beetles, and cutworms.

Recipe: Finely chop 15 peppers and add 1 liter of water. Steep for 24 hours, strain, and apply.

Onion Brew

Onion brew repels a variety of insects, including ants, aphids, army worms, and especially borer insects such as caterpillars.

Recipe: Finely chop 4 cups of onion and add to 2 liters of water. Steep for 24 hours, strain, and apply. Best used when fermented.

Garlic Brew

This brew works to repel many insects, including ants, aphids, and caterpillars, as well as nematodes.

Recipe: Finely chop one-half cup of garlic and add to three-fourths liter of water. Soak for 24 hours, strain, and apply to plant and surrounding soil.

Mint *(Mentha)*

Mint is relatively easy to grow, if given a lot of water, and once established, can be hard to stop. It can be grown alone or planted among other vegetables, though it should be kept

away from cucumbers. It can be used as a repellent against aphids, cabbage pests, and flea beetles, as well as against bacterial diseases.

Recipe: Cut fresh mint leaves and citrus (orange or lemon) peels to make a repellant. Place the pieces in a small pan covered with water, and bring to a boil. Soak overnight and apply during the evening watering.

Tomato-Leaf Spray

This is a particularly effective repellent for aphids and caterpillars, but should not be used on tomatoes, eggplants, peppers, or potatoes.

Recipe: Pack 1 quart of tomato leaves in a sturdy, heat-resistant bucket. Pour 1 quart of boiling water over the leaves, and let the mixture steep for one hour. Next, strain the mixture through a cloth, squeezing the leaf dregs to remove as much liquid as possible. Dilute the mixture with water before using.

Wood Ash

Sprinkling a layer of wood ash around the base of plants a couple of times each week will repel some surface-feeding insects, slugs, and snails by causing dehydration. Wood ash is very fine and gritty, so it works well to deter chewing insects when dusted over certain crops. Once ash gets wet, however, it loses its deterring properties. Continuous use of ash may increase the soil pH or accumulate salts to levels harmful to plants.

Neem *(Azadirachta indica)*

Neem trees are abundant in many regions and can be used as a very potent natural bio-insecticide. Neem's extracts have an effect on nearly 400 species of insects, including major pests (moths, weevils, beetles, and leaf miners). The most effective insecticide comes from the seed, but the leaves can also be used. These extracts do not kill insects directly but effectively prevent their reproduction.

Recipe: Dry leaves in shade, as UV rays from the sun break down azadirachtin, their principal chemical compound. When leaves are dry, pound and mix a generous handful of the powder with 10 liters of water. Let steep for 12 to 24 hours. Strain and apply during the evening watering.

Gliricidia *(Gliricidia sepium)*

Gliricidia is a wonderful tree for soil amelioration due to its ability to fix nitrogen. Its leaves can also provide an insecticide that is effective on both chewing and boring insects.

Recipe: There are two ways to use Gliricidia. First, pick leaves and place near plants to be protected. When they become dry, remove or leave as mulch, and reapply fresh ones. Second, pound a generous amount of leaves, add a small amount of water, and soak for 24 hours. Strain and apply during the evening watering.

Tobacco *(Nicotiana tabacum)*

Tobacco contains nicotine, which can be used as a potent insecticide. (Be careful, as nicotine is a poison and high concentrations can be lethal.) Target organisms include aphids, cabbage

worms, caterpillars, flea beetles, grain weevils, leaf miners, mites, stem borers, thrips, rust, some fungi, and leaf-curl virus. Note: Do not use on tomatoes, eggplants, peppers, or potatoes.

Recipe: First, dry and pound the leaves. Add 20 grams of tobacco to 1 liter of water, soak overnight, and apply during the evening watering.

Soap Solution

Certain brands of hand soap, particularly the local homemade varieties that are plant-based, and some liquid dish detergents can be used in solution as a contact insecticide. (Dry dish soaps and clothes washing detergents should not be used.) To be effective, a soap spray must be applied directly and must thoroughly cover the insect. Most soft-bodied insects and mites are susceptible to soap sprays, including aphids, caterpillars, lace bugs, leaf hoppers, mealy bugs, mites, liver worms, saw flies, scale crawlers, spittle bugs, springtails , thrips, and white flies. Soap solutions can be harmful to certain plants, so caution must be used. If in doubt, test a small area on the plant and wait 24 hours to see if there is an effect. To be safe, always rinse the area treated with water a few hours after application of soap spray.

Recipe: Use 2 tablespoons of grated soap per 1 1/2 liters of water. Apply directly with watering can or homemade broom.

Bug Juice Spray

Gardeners use these sprays effectively to control pests. Pests of a given species will not feed on the plants if members of their colony are found dead on those plants. The smell serves as a repellent and as a warning for the other incoming pests. This is an especially effective insecticide for small garden plots or nursery spaces, but not practical for large-scale operations.

Recipe: Liquefy one-half cup of the targeted beetles, bugs, caterpillars, or slugs in 2 cups of lukewarm water by grinding and straining. (It's easiest to make this concoction by mashing the bugs and slowly adding in the water.) Dilute one-fourth cup of the bug juice with 1 1/2 cups of water, and spray all plant surfaces thoroughly.

Hillbilly Breath

This homemade insecticide can be used as a catch-all as it deters many different types of insect pests.

Recipe: Mix together in water some chopped mint, ash, garlic, tobacco, and no more than 1 tablespoon of soap. Steep the concoction for 24 hours, strain, and apply the solution with a watering can or a homemade broom.

Beer

Beer attracts slugs. Place a saucer or cup just below the soil surface and fill it with beer. Slugs finding their way into the container will not be able to get out and will drown.

Standard Procedures for the Preparation and Application of Homemade Extracts

1. Use utensils for the extract preparation that are not used for food preparation, for drinking, or as cooking water containers. Clean all the utensils thoroughly after using them.
2. Do not have direct contact with the crude extract while in the process of preparation or during application.
3. Make sure to place the extract out of the reach of children and house pets when leaving it overnight.
4. Harvest all of the mature and ripe fruits from any plant before extract application.
5. Always test the extract formulation on a few infected plants before going into large-scale spraying.
6. Wear protective clothing while applying the extract.
7. Wash hands after handling the extract.

41. Market Prices: Economic Incentives for Food Conservation

Contributed by Peace Corps/Togo

Objective: To show how to obtain marketing information in the community that will be useful for deciding when to sell produce

Ages: Middle, older

Materials: Paper, writing utensils

Time: One hour to several days per survey session depending on the size of the community; sessions dispersed throughout the year

Procedure:

In this activity, kids survey individuals in the community to discover how food prices change throughout the year. This information can be useful in helping farmers decide when to sell their products.

Note: As in the previous activity, be sure to verify that it is culturally appropriate for your kids to be conducting surveys. In some places, such activity arouses widespread suspicion and even hostility.

The price of grain and vegetables goes up and down with the seasons. When a product is abundant, the price is low. When it is scarce, the price is high. Farmers can use this information to help decide what and when to plant and when to sell their crops.

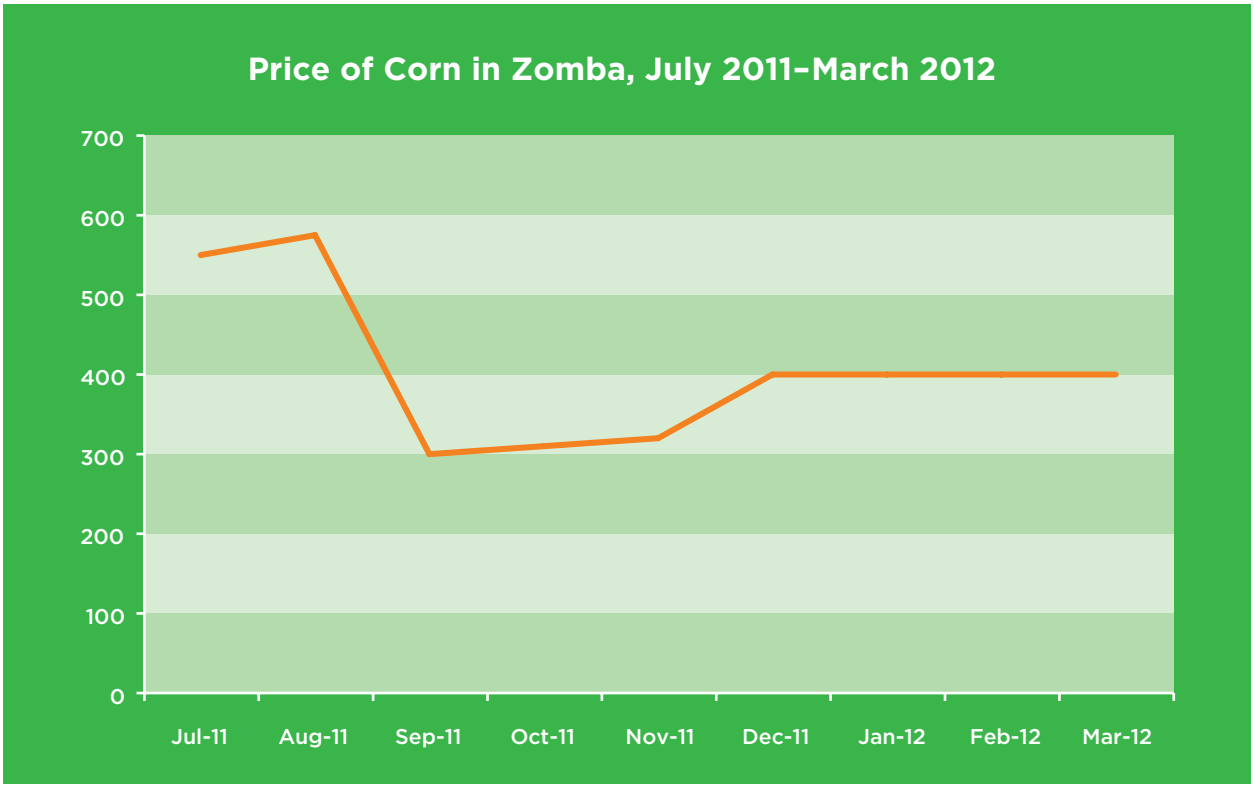
Ask your kids to find people who are in different stages of marketing crops within your community. They should ask the people to note the prices of their crops and whether they go to the market every week, once a month, or at some other interval. They should try to find people who are in different markets: small ones, major ones, city, countryside, etc.

With the information your kids collect, make a price chart to see how the price goes up and down. This is where you will find the months when you can sell at high prices and the months when it's best to buy.

For the greatest accuracy, you can carry out the survey over a span of several months to a year, but this may not be practical for your situation. If that is the case, your kids will have to rely on people's memories.

Here is an example that you can follow and draw in your notebook:

How the price of grain is changing during the year



42. Seed Germination Experiments

Objective: To learn the soils and environmental conditions that produce the best plant growth

Ages: Young, middle

Materials: Seeds of one kind, soil of different kinds, planting containers or bottom halves of plastic bottles, and other items depending on the experiment. To make a planter from a plastic bottle: bottle, scissors or sharp knife, muslin cloth roughly two inches in diameter, rubber band

Time: 20 minutes to set up experiments; several weeks for results to appear

Procedure:

To illustrate how to successfully grow crops in your community, have your kids experiment by planting seeds in different environmental conditions and comparing the results. The conditions that you want to compare will vary with the site, but you might, for example, compare soil treated with compost with soil without compost, soil in permagardens with soil in traditional gardens, topsoil with mineral soil, loam with sand or clay, sites treated with organic and synthetic pesticides, different watering regimens, and different soil, water, and other conditions.

To make planters from plastic bottles, carefully cut off the top third of a bottle with scissors or a sharp knife. (An X-Acto knife is ideal.) Wrap the cloth around the mouth, attaching it with a rubber band. Turn the top third upside down, and place it in the bottom two-thirds. Put soil, seeds, and water in the upside-down bottle third.

Be sure to use the same type and number of seeds in all of the experimental plots and to make sure that only one variable is different in each. Organize the kids to water and care for the plants, protect them from animals and pests, and watch what happens.

43. What Do You Need to Grow Food?

Contributed by Peace Corps/Dominican Republic

Objective: To learn the different natural resources necessary to grow food

Ages: Young, middle

Materials: Paper or cardboard, art supplies

Time: 20 minutes

Procedure:

Organize the kids into pairs or small teams, and give each team drawing paper and supplies (e.g., crayons, paints, markers, pencils). Ask them to draw a familiar crop grown in the area and its seed or fruit, and then make lines radiating from the drawing toward a natural resource necessary to grow the crop (e.g., soil, water, clean air, space, pollinator, pest controls). Then, ask each group to draw lines radiating from each of these resources to drawings portraying what is necessary for these resources to be present and healthy. For example:

- **Soil:** Dead leaves and other organic matter, soil animals to break down the organic matter and stir up the soil, rock to contribute to making the soil and providing nutrients, plant cover to prevent it from washing or blowing away
- **Clean Water:** Healthy soil and plants upstream to filter rainwater before it enters streams, plants especially along the stream banks to prevent soil from washing into streams
- **Clean Air:** Trees and other plants to clean the air
- **Pest Controls:** Habitat for insects that feed on insect pests
- **Pollinators:** Food, water, and habitat for pollinators

Discussion Questions:

If we want to grow crops …

1. Why do you think it is important to maintain a healthy environment for insects and other living things?
2. Why do you think it is important to keep trees around?
3. What do we need to do with the environment around here to keep growing crops?

Variation:

Kids can create this diagram with string instead of drawn lines and make an exhibit.

44. Where Does Your Food Come From?

Contributed by Peace Corps/Togo

Objectives: To see where your community's food comes from, and to learn the social and economic advantages of buying local produce

Ages: Middle, older

Materials: Paper or index cards, writing utensils, world map, string, tape

Time: 30 minutes for preparation; 30–45 minutes for game

Procedure:

Courtesy of PC

To start, ask the kids to go home or visit a local store with a piece of scrap paper and find a product that they might find in the community shop (e.g., soap, rice, canned tomatoes, cookies, milk powder, black bags). Ask them to write down or draw the product and its country of origin, according to the product label. When the group reassembles with their information, have a world map set up on the wall or floor. Divide the participants into teams to consider each kid's product, one by one, and ask where it comes from. If the opposing team's participants can guess the product's country of origin, they win a point and you will tape a card with the product described under the country on the map. Attach the string to the card, and tack the other end to your country. Now participants can see where the products came from and how far they had to travel to get to their community.

Discussion Questions:

1. What does this activity show us exactly? (The percentage of foods and other products that are imported from somewhere else.)
2. Why is it important to eat locally? (It supports local farmers and craftspeople; it requires less fossil fuel use because transportation time is shorter; locally grown food is often fresher and more nutritious.)
3. If your product was not local, try to brainstorm some ways to replace the imported product, such as creating reusable bags made with old fabric versus buying new ones, eating locally grown vegetables, and using community-made soap.
4. Imagine you are running your household and it is you who decides what to buy. How can you talk with your store owners and encourage market vendors to have local products brought to the market to sell to people?

Courtesy of PC/Mexico

Games

Games

This chapter describes a few easy games that can be applied to a wide range of topics. Additional games are discussed by topic in other chapters, and many of these can be adapted as well for different subjects.

45. Environmental Word Guessing Game

Objective: To remind kids of basic environmental concepts

Ages: Middle, older

Materials: Writing utensils, drawing paper, flip chart for recording team wins, list of environmental words

Time: 30 minutes

Procedure:

This is a fun adaptation of the popular board game Pictionary that can develop language and critical-thinking skills.

This version is very simple. Divide the kids up into pairs. The game begins with one of the kids from each pair serving as an illustrator. These kids secretly look at the printed word that you have selected. They return to their partners and, when you say "Go," try to draw pictures of the word they have seen. The first team that calls out the word wins the round. Cycle through the kids so that each one gets to be an illustrator. Watch out for illustrators whispering the words to their partners! Play until the kids get bored.

Prior to the start of the game, of course, you need to come up with a list of environmental words for your kids to draw. These can be easy, like "elephant" or difficult, such as "sewage," "water pollution," or "litter." You will probably have to judge what "counts" (e.g., Can a kid call out "iguana," or will "lizard" or "reptile" suffice?). Choose the words that fit the ages of your kids and the environmental concepts you want them to review.

46. Jeopardy!-Style Game

Objectives: To increase young people's knowledge of simple concepts; to gauge their subject mastery

Ages: Middle, older

Materials: For drawing the game board and scoreboard, large pieces of paper (flip chart paper, butcher paper, poster board, etc.) or blackboard, wall, or even sidewalk; markers or chalk, paper and writing utensil for writing down questions and answers (for your use)

Time: 30–45 minutes, depending on discussion length

Procedure:

Jeopardy! is a popular game on American television in which contestants are given an answer, and they have to guess the question. Typically there are four or five columns (depending on

the topics you are working with), each with a different subject within an overall theme, and five rows. The top row is worth the least, typically 10 points, and is the easiest answer in the column. Answers get progressively more difficult as you move down the column, until the answers in the bottom row are worth, say, 50 points. See the illustration below.

Category 1	Category 2	Category 3	Category 4	Category 5
10 points	10 points	10 points	10 points	10 points
20 points	20 points	20 points	20 points	20 points
30 points	30 points	30 points	30 points	30 points
40 points	40 points	40 points	40 points	40 points
50 points	50 points	50 points	50 points	50 points

This is a version adapted for groups of young people. To play, organize the kids into teams. Choose one team to go first, perhaps by asking each team to guess the number of fingers you are holding out behind your back. The team chooses a category and then, typically, the easiest row, without knowing what the answer is. You then read the answer to the team. If it gets the question right, it is awarded 10 points, and you then move to the next team, and so on. If the team misses the question, you move to the second team and give it a shot. If the second team gets the answer correct, it gets 10 points and then gets the chance to choose the next category and be the first to guess the right question. If they don't come up with the correct question, move to the next team and so forth. If no team gets the question right, read the question and briefly discuss so that everyone understands it (hence the educational value). Continue in this vein until you run out of questions.

To wrap up the game, you can play "Final Jeopardy." Write down a final answer and its question. Tell the teams what the category of the answer is, but don't tell them what it is. Now, ask each team to decide how much of its accumulated point total it wants to wager in trying to come up with the right question. Then read the answer, and ask each team to silently write

down the question. Ask them to read their questions. Those that have the correct question get to add their wager to their point total. Those that don't get their wager deducted from their point total. This gives the teams yet another chance to win and makes the final result unpredictable, and the game, therefore, more exciting.

Obviously, you have an endless array of subject choices and questions/answers from which to choose. Here is one example, focusing on solid waste management:

Categories

Handling Waste

10 points:

- **Answer:** Composting, feeding chickens.
- **Question:** What can you do with food scraps and crop residues?

20 points:

- **Answer:** Reduce, Reuse, Recycle
- **Question:** What are the three "R's" to keep in mind when handling solid waste?

30 points:

- **Answer:** Recycle
- **Question:** What is the best way to handle plastic and metal waste?

40 points:

- **Answer:** Take to a qualified collection facility
- **Question:** What is the best way to handle toxic and hazardous waste?

50 points:

- **Answer:** Burn in a high-temperature incinerator
- **Question:** What is the best way to handle medical waste?

Recycling

10 points:

- **Answer:** Personalized, painted picture frames
- **Question:** What can you make with recycled cardboard?

20 points:

- **Answer:** Tote bags, purses, soccer nets, jump ropes
- **Question:** What can you make with plastic bags?

30 points:

- **Answer:** Trash cans, brooms, planters for seeds and small plants
- **Question:** What can you make with plastic bottles?

40 points:

- **Answer:** Little colorful beads
- **Question:** What can you make with waste paper?

50 points:

- **Answer:** Eco-bricks (mixed in with concrete to make the walls of small buildings)
- **Question:** What can you make with plastic bottles and waste paper (stuffed inside the bottles)?

Compost

10 points:

- **Answer:** Food scraps and crop residues
- **Question:** What can be put into compost?

20 points:

- **Answer:** Meat and dairy products, human and animal waste
- **Question:** What should not be put into compost?

30 points:

- **Answer:** Adds nutrients and improves ability to store water and oxygen
- **Question:** What does compost do for soil?

40 points:

- **Answer:** Bacteria, insects, worms, fungi
- **Question:** What are some living things that make compost through their eating habits?

50 points:

- **Answer:** Diseases and parasites
- **Question:** Why are human and some animal wastes (domestic dogs and cats) too dangerous for compost?

Environmental Issues

10 points:

- **Answer:** Ugly landscape
- **Question:** What environmental problem results from people throwing trash on the ground?

20 points:

- **Answer:** Bad odors
- **Question:** What environmental problem results from dumping rotting garbage, or leaving human and animal waste, on the ground?

30 points:

- **Answer:** Breathing difficulties
- **Question:** What problem results from breathing in smoke from burning trash?

40 points:

- **Answer:** Rats and flies
- **Question:** What are some pests that are attracted by rotting garbage on the ground?

50 points:

- **Answer:** More mosquito-borne diseases
- **Question:** What problem can result from water collecting in tin cans, old tires, and other trash items (mosquito breeding sites)?

47. Scavenger Hunts

Objective: To make kids aware of various natural phenomena and environmental issues

Ages: Young, middle

Materials: For drawing scavenger hunt items, index cards or paper; writing utensils; bags or other receptacles for collections

Time: 30–60 minutes, depending on the focus of the hunt

Procedure:

Scavenger hunts are enjoyable ways to get kids outside, developing their skills in observing the world around them. To prepare, decide on the theme of the hunt, and then scout the area where the kids will be searching so you can know what the kids are likely to find. Once the hunt is ready to go, organize the kids in teams of two to three and give each team a list of

things to look for. Some items they can collect, but rather than picking up such objects as flowers and certain live insects, ask the kids to draw pictures of what they found (materials: index cards/paper, writing utensils) and to be prepared to show the adults where they found them. Set boundaries and give them a timeline (e.g., 15–30 minutes). The first team that finds all the items wins the game.

Some scavenger hunt examples (of course, you can combine features from different lists to fit your particular location and do different scavenger hunts on different days):

Nature Scavenger Hunt (1)

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Things to look for (some can be collected; others should be drawn or described):

Animal signs

- An animal track
- Five potential food sources and what animal might eat them
- Three signs of animals having eaten
- An animal home or shelter (draw or describe)
- Three animal sounds (describe)
- Feathers, bones, or shed snake skin

Insects and invertebrates

- A flying insect
- A butterfly or moth
- A grasshopper or cricket
- An insect found under a log
- An ant
- A fly
- A spider's web
- A worm
- A mosquito
- An invertebrate that is not an insect (e.g., spider, millipede, mite)
- A sign of insect activity: holes in leaves, anthills, tunneling in logs, empty caterpillar nests, plant galls, insect egg cases, wasp and bee nests

Leaves

- A leaf with smooth edges
- A leaf with edges with small teeth

- A leaf with big teeth or lobes
- A leaf that isn't green
- A soft leaf
- A fuzzy leaf
- A leaf as wide as your foot
- A leaf as long as your little finger
- A leaf so small you can cover it with your thumb
- A leaf eaten by something

Flowers

- A flower with petals bigger than your pinky fingernail
- A flower with three petals
- A flower with more than three petals
- A plant with more than one flower on one stalk
- A plant with only one flower on one stalk
- A white flower, a yellow flower, etc.
- A flower that smells sweet
- A flower that has no scent
- A flower with easily seen stamens and pistils (this may need some explanation)
- A flower with a bee on it
- A flower with another type of insect on it

Seeds

- Dispersed by wind
- Dispersed by birds
- Dispersed by animals (ingested or stuck to fur)

Discussion Questions:

1. What were your favorite finds?
2. What surprises did you see?
3. What was the most beautiful thing you found?
4. Where did you find this item?
5. Which things were common and which were rare?

Nature Scavenger Hunt (2)

Adapted from Sharing Nature With Children

Collect only those things that you can carry safely and without damage.

- A feather
- Seeds dispersed by the wind
- Other seeds
- Leaves
- Pieces of human-made litter
- A bone
- A camouflaged animal or insect
- Something round
- Part of an egg
- Something fuzzy
- Something sharp
- A thorn
- Something perfectly straight
- Something beautiful
- Something of no use in nature (Note: Everything in nature is useful.)
- A chewed leaf
- Something that makes a noise
- Something white
- Something important in nature (Note: Everything in nature is important.)
- Exactly 20 of something
- Something that reminds you of yourself
- Something soft
- A sun trap (Note: A sun trap is anything that captures the sun's heat (water, rocks, plants, animals.)

Nature Scavenger Hunt (3)

Adapted from 101 Nature Activities *with permission from Sanborn Western Camps*

The things they find must be from nature; human objects don't count. They must not kill/hurt anything they take.

- Something beautiful
- Something ugly
- Something red
- Something humans need to survive
- Something scary
- Something that you wouldn't want to eat
- Something that has no function (Note: Everything in nature has a function.)
- Something hard
- Something soft
- Something that has a strong scent
- Two different types of seeds
- Evidence of an animal

Encourage students to think of even more categories before the scavenger hunt begins.

Alphabet Scavenger Hunt (4)

Adapted from 101 Nature Activities, *with permission from Sanborn Western Camps*

Have kids find one object for every letter of the alphabet. Ask which letters they had the most problems with; how many things they were able to find that they did not realize were there; who was surprised at what they found or where they found it.

Litter Scavenger Hunt (5)

Kids look for different categories of litter (e.g., empty cigarette boxes, cigarette butts, plastic bags, plastic bottles, bottle caps). You can assign point totals for each type of item, depending on its rarity or relative environmental impact, and also award points for the numbers of items collected. You will need to provide sacks or some other receptacles for the kids to use and be very clear as to the types of litter they should not handle (e.g., broken glass and rusting cans with sharp edges). It's best to distribute gloves to the kids with this activity to prevent injury, and to insist on washing hands afterward.

Discussion Questions:

1. Looking at the litter, what can you conclude about who is doing the littering? (Kids, adults, smokers, people who visit fast-food restaurants, etc.)
2. What strategies could reduce the amount of litter you've seen? Do you think we could do something about this? Brainstorm ideas!

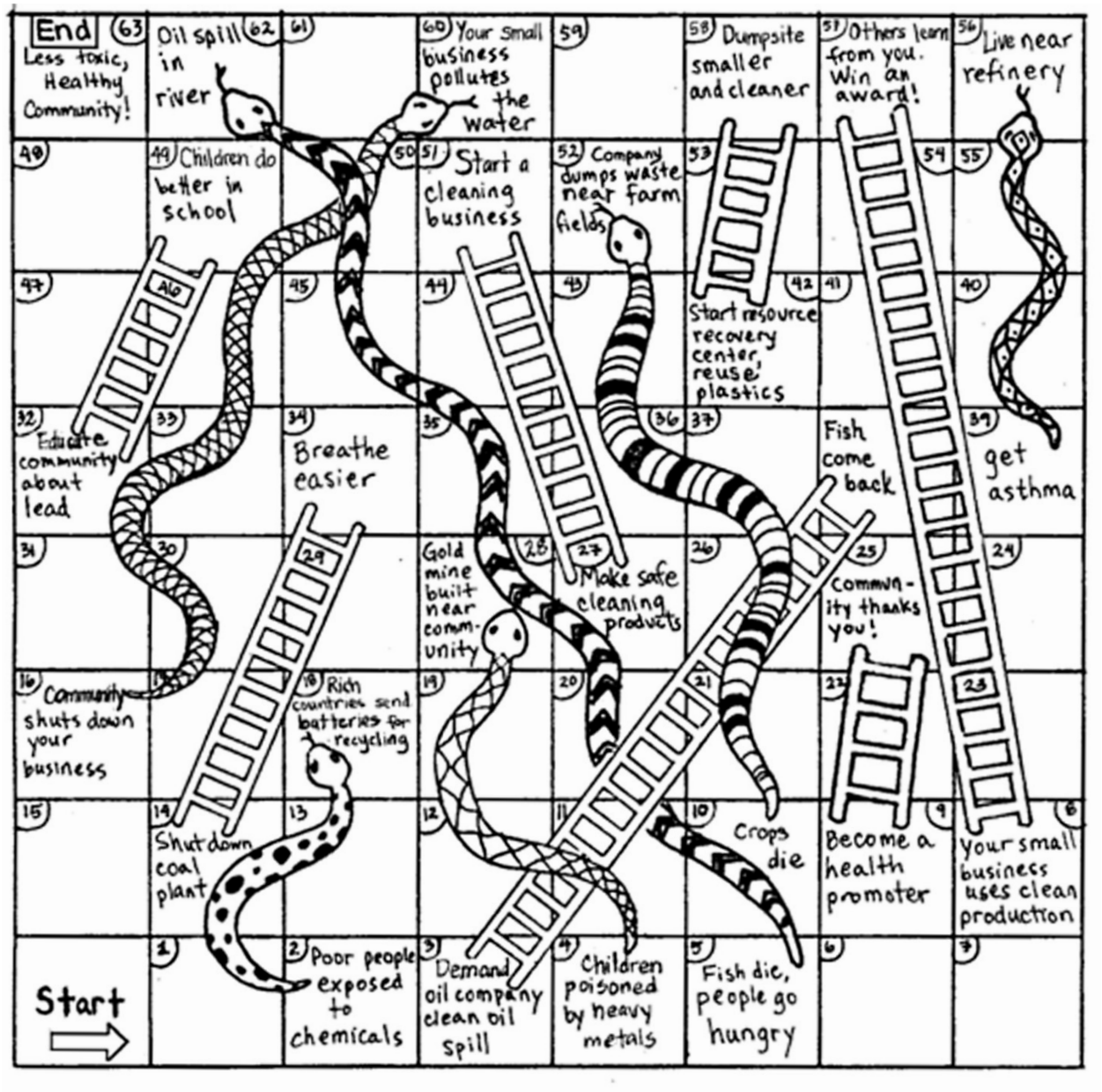


Illustration credit: Hesperian

48. Snakes (Chutes) and Ladders

Adapted from A Community Guide to Environmental Health*, from Hesperian Publications*

Objective: To teach basic environmental concepts

Ages: Young, middle, older

Materials: Dice; seeds, stones, or shells as game markers; materials to make game board (large sheet of paper and markers, cardboard, wood and paint, etc.)

Time: 20–30 minutes

Procedure:

This is a game that many remember playing in their childhoods. You can easily adapt it to teach any number of environmental topics. The rules of the game are as follows:

- The game can be played by two to four people or by teams. Each player or team uses one marker (a seed, stone, or shell) to show their place on the board.
- The first player throws the die and moves his or her marker according to the number shown, beginning from square 1, marked START.
- If a player rolls a 6, the player moves 6 spaces and then rolls the die for a second turn. Otherwise, the die moves to the next player.
- If the marker lands on the head of a snake, the player reads the message on the square out loud, then moves the marker to the snake tail, and reads the message on that square. The message at the snake's head will be a negative human action, and the message at the tail will be the consequence. The player's next move starts from the snake's tail.
- If a marker lands at the bottom of a ladder, the player reads the message on the square out loud, then moves the marker to the top of the ladder, and reads the message on that square. The message at the bottom of the ladder will be a positive human action, and the message at the top will be the positive consequence. The player's next turn starts from the top of the ladder.
- The first player to reach the last square wins. A player must throw the exact number needed to land on the last square.

An example of the Snakes and Ladders game applied to toxic waste issues is on the previous page.

Have fun designing your own game!

49. Treasure Hunts

Objective: To make kids aware of various natural phenomena

Ages: Young

Materials: Index cards or paper; pencil

Time: 30–60 minutes, depending on the hunt

Procedure:

Treasure hunts are another fun strategy for encouraging kids to think about and observe their environment. In treasure hunts, teams of kids follow a string of clues that will lead them to the "treasure," which can be a piece of candy, a pretty rock, or some other small, inexpensive object. The hunt can focus kids on all sorts of natural phenomena: flowers being visited by bees or birds; fallen logs; ant and termite nests; trees with distinctive leaves, fruits, and other features; etc.

To begin the hunt, organize the kids into teams of two to three, and give each a piece of paper with a written clue on it. Prior to the hunt, you will have mapped out a route, located

the sites you want the kids to find, composed the clues that will lead the kids along the route, and placed enough copies of the clues for each team in their respective sites. The clue should not be crystal clear: e.g., “Go to the mango tree down the street on the left.” Instead, the kids would need to figure it out, e.g., “A September snack that leaves orange strings in your teeth!” Or you can phrase the clue as a short poem: “This tree in September / Makes a snack to remember.” When a team thinks it has figured out the clue, it races to the site to which they think the clue is pointing, whereupon they find another written clue that will direct them to the next site, and so on.

To minimize kids following other teams rather than trying to figure out the clues themselves, you can start the teams from different places. Or you can encourage teams to split up, with one team member serving as a decoy who draws attention by noisily racing off to fake sites while other team members quietly head for the correct places. You might also start the teams at different times.

Photo: Rick M. Reyes, Courtesy of Photoshare

Integrating English Language and Literacy Learning Into Environmental Camps

Integrating English Language and Literacy Learning into Environmental Camps

Contributed by Annaliza Thomas, Peace Corps Literacy Specialist

Many Volunteers planning and implementing environmental camps and clubs also want to integrate English literacy and language components into their work. Often, however, they worry that doing so will be too academic and that they don't have the skillset to teach English to children. It's easier than you think!

Integrating English literacy and language into any youth camp is a great way to give students a low-risk opportunity to practice the language. Language learning is often broken into four major domains: reading, writing, speaking, and listening. In formal classes, many teachers focus on the first two domains. As a result, students often miss opportunities to hear and speak English. It is important, however, to develop all four domains for a student to become competent and fluent in any language, and a camp provides students with a fun way to hear and speak English.

If you are conducting your camp in English, then you are already providing language practice for the students! In order to enhance this opportunity, you can use some of these tips to reinforce language learning:

- Use simple, short sentences to give instructions. Consider writing instructions on the board or on poster paper for the students to see while you say them. This will help students connect what you are saying to the written language.
- Create signs labeling stations and locations in the camp area (e.g., bathroom, art table, equipment box).
- Sing camp songs and chants in English. Write the words to some of the songs you are singing on chart paper for the students to see. Songs/chants with a call-and-response component are great.
- Create a Word Wall with any new environmental/academic vocabulary that students use during the week. Many students become proficient enough in English to converse as well as to read and write basic materials, but they struggle to learn and use academic English vocabulary. A camp is a safe, fun place for students to learn academic science language, and the Word Wall of key vocabulary can be a fun way to reinforce this. Refer to the Word Wall whenever possible to give students a connection between the spoken and written word. If students are given journals, tell them to refer to the Word Wall to help them write about their experiences and learning.

Here are just a few ways you can help students practice English while enjoying the environmental club or camp at the same time:

Alphabet Books

This can be a great individual activity (one kid completes 26 letters) or it can be done collaboratively (each kid is assigned a letter).

Identification

Teaching kids about species identification can be an exciting activity for an environmental camp. One way to connect this to language/literacy is to have the participants create their

own species-identification cards. Kids can draw and color different species on a piece of card stock. You may want to create a Word Wall with the common and scientific names of animals and plants to help the kids with spelling.

Songs and Chants

Interviews

Kids can interview each other about the camp and/or do a mock radio broadcast.

Camp Newspaper

Kids can create a newspaper, writing short articles, taking photos, drawing comics, and composing editorials.

Bookmaking

A fun activity that promotes a love for books and writing is bookmaking. This activity teaches kids about the importance of recycling and shows them how to make recycled paper.

Literacy Gardens

If gardening is part of a camp, you and the kids can make signs and labels, identifying the plants and gardening features such as compost piles and water retention berms, providing directions, and asking thought-provoking questions and riddles.

Nature Trails

You and the kids can make a self-guiding nature trail, with signs and labels or with printed pamphlets.

Poster Making

Creating posters is a great way for kids to use language while practicing environmental advocacy.

Word Searches, Coloring Pages, Crossword Puzzles, and Riddles

Word Dice

Create two dice. On one, write the names of local animals (e.g., iguana, howler monkey). On the second, write emotions (e.g., scared, happy, mad). Have the kids roll the dice. The participants act out the words that appear face-up.

Scavenger Hunts

This activity involves several language and literacy skills. Regardless of how scavenger hunts are designed, kids will be practicing or using their reading skills, short- and long-term memory, and organization skills. (See Scavenger Hunts, Activity 47.)

Journals

“Whereas a diary or personal journal records your feelings toward yourself and others, a nature journal primarily records your responses to and reflections about the world of nature around you.” —Claire Walker Lesley

You can help kids focus and reflect by situating them in a quiet place and asking them to write silently for a few minutes. They can record what they see, smell, touch,, and hear. They can notice colors, shapes, and textures. If they are settled down, the kids can crumple leaves

and blossoms and smell them, gently rub rocks and tree bark with their cheeks, and lie on their backs or stomachs. You can stimulate thinking by posing a provocative question to the group: e.g., What will this town look like in 10 years? Why is this tree or this forest important to people and to other living things? Why do people litter? Kids can express their feelings in a variety of ways, including brief essays, poems, sketches, and photos cut out from magazines; they can press leaves and flowers between the journal pages. Kids can also volunteer their favorite quotes to be written on flip chart paper and put on the wall.

The following six activities were adapted with permission from Zoomy Zoomy*, by Hannah Fox (Tusitala Publishing)*

"Remember When?" Stories

Two kids recall a (pretend) story and tell it to the group together, taking turns as they do so. They can be themselves, or they can pretend to be an animal. Another pair can act out the story as it is being told. Storytellers should pause so the actors can perform the story. For example:

- Remember when we had to migrate all that distance to our winter home? (a bird)
- Remember when we got lost in the forest?
- Remember when we had that amazing journey to the ocean? (a raindrop)

Make a Habitat Picture

This group activity develops basic storytelling skills. Start the playing by having participants get into a standing circle. The middle of the circle will be the performance space. Everyone will be building a frozen picture together, one at a time, with no planning what the picture will be in advance. The person who would like to go first steps into the center of the circle and says, "I am a/n (object: tree, creek, etc.)," and then strikes a frozen pose. Another person in the circle must immediately step in to join that person, strike a pose, and state aloud what she or he is. Everyone must join the picture to become an element of the scene/bigger picture.

The Storytelling Spine

A fun way to involve a group in creating an original environmental story. As you go around a circle, each participant contributes one element to the tale, in the order of the numbered sentences. This activity works with both small and large groups.

1. Once upon a time …
2. And every day …
3. But one day …
4. Because of that …
5. Suddenly …
6. Because of that …
7. Until finally …
8. Ever since then …
9. And the moral of the story is …

Rose and Thorn (or some other similar plant in your country)

Ask the kids to share one positive environmental fact about their life (the "rose") and one environmental fact that annoys them (the "thorn").

Wish for the World

Take a soccer ball or a wadded-up ball of paper, and ask the kids to sit or stand in a circle and pass the object around. As they take turns holding it, ask the kids to share a "wish for the world."

Animal Scenes

Assign two kids a different animal each. Inform them that they will take on the qualities of that animal but remain human. Now give them the *who, what,* and *where* of the scene they will act out. For example, it might be a monkey-like kid asking an elephant-like kid how to play soccer, or a crocodile-like kid meeting a fish-like kid for a date to a local dance. The kids will now improvise the scene.

Natural Resource Management Activities

Natural Resource Management Activities

50. Case Studies: What Would You Do?

Contributed by Peace Corps/Armenia

Objectives: To develop values and beliefs related to the environment and to consider possible environmental actions

Ages: Middle, older

Materials: Copies of dilemmas for each group

Time: 30–45 minutes

Procedure:

Before the session begins, compose a series of environmental dilemmas appropriate to your community. An example from Peace Corps/Armenia is below. Once the kids have gathered, divide the participants into teams; give each a copy of the environmental dilemmas and proposed solutions you have composed. Each team must decide which solution they think is best. After discussion time, each team will tell what they chose and why.

You can use this activity to reinforce "right" answers that you have gone over previously, or you can choose dilemmas that are deliberately ambiguous in order to stimulate enthusiastic debate and development of personal values.

Examples That Feature Different Alternatives

Example 1. One day you are walking through a park with a good friend, who is eating food out of a plastic bag. When your friend is finished eating, they drop the bag on the ground. You ask your friend to pick it up, but they refuse, with the reasoning that this is a public area and therefore it is not important to care about it.

In this situation, what would you do?

a) Again ask your friend to pick up the trash.

b) Pick up the trash yourself.

c) Use this as an educational opportunity to tell your friend about the problems that littering causes in the environment.

d) Do nothing.

e) Something else (be specific).

Discussion Questions:

1. Is littering a problem in your community? If yes, how?
2. How does littering affect your personal environment?
3. What problems does littering create for others (including animals) in your community?
4. What can you or other members of your community do about this problem?

Example 2. You live near a wooded area where you like to watch wildlife and enjoy the shade from the many tall trees. One day you discover that your neighbors are planning to cut down all the trees. You ask them nicely not to cut down the trees so the trees can serve both as shade and as homes for different types of animals. They laugh at you and say no.

In this situation, what would you do?

a) Plead with them again to preserve the area for wildlife, etc.

b) Move to a different place.

c) Replace the trees cut down with baby trees.

d) Use this as an educational opportunity to tell them about the importance of trees in the environment.

e) Do nothing.

f) Something else (be specific).

Discussion Questions:

1. Is the cutting down of trees a problem in your community? If yes, how?
2. How does cutting down trees affect your personal environment?
3. What problems does cutting down trees create for other members (including animals) of your community?
4. What can you or other members of your community do about this problem?

Example 3. You are a builder/mason. You have recently been given a grant by an international organization to renovate a large city building. As part of the renovation, you are required to dispose of construction debris in an environmentally safe manner. However, there is no money specifically for this.

In this situation, what would you do?

a) Rent a truck and ship the construction debris to the official city landfill 15 km away.

b) Take the debris to an unofficial, but commonly used, dumping site on the river 1 km away.

c) Leave the debris piled near the renovated building.

d) Something else (be specific).

Discussion Questions:

1. Is waste disposal a problem in your community? If yes, how?
2. How does waste disposal affect your personal environment?
3. What problems does waste disposal create for other members (including animals) of your community?
4. What can you or other members of your community do about this problem?

Examples That Focus on Solid Waste and Do Not Present Alternative Actions

1. You know that there is a waste problem now and that the problem is growing. You want to start recycling, but your parents don't seem to have much interest. What do you do?
2. At the end of an outdoor party, your friends start throwing bottles into the river even though there is a garbage can nearby. The bottles break and pieces of glass are scattered down below. You know this makes the river unsafe and ugly. They are throwing more bottles. What do you do?
3. Your friend just bought some candy. You eat the candy, and your friend tries to throw the wrapper into a garbage can and misses. You both laugh, and your friend starts walking away. What do you do?
4. You go to visit some of your family on the other side of town. You notice that your uncle dumps his garbage on the side of his hill where it goes down onto the street. You see kids walking by the mess and notice that the water flows down the street, carrying this garbage. What do you do?
5. Your family has a large garden. You have always fertilized with cow manure, but you need more for the garden. You've talked about composting with your family, but they continue to throw the kitchen scraps down the drain or in the garbage. What do you do?
6. You are becoming aware that litter is ugly and dangerous. But when you pick garbage up and throw it in the can, sometimes people laugh at you. What do you do?
7. You walk down the street and notice some kids in front of you who stop and pick up some litter and throw it away. You think this is wonderful. What do you do?
8. You find an empty can and some plastic bottles on the street. You bring them home to reuse as something else. You use them as planters, and they look good. Your mother compliments you and is very happy. What do you do?
9. You want to start a cleanup crew. You meet once a month to clean a specific area around the town. People notice the difference and like it. You know you need more people to continue the project. What do you do?
10. You notice an abundance of litter and think that some of these things can be reused for something else. But you can't think of all the ideas and don't know how to use some of your ideas. What do you do?

Follow-Up Activities

1. Follow up by discussing the responses the students give. If the answers are negative, try to talk about them. What can we do to change behavior and make cleaning up the environment more acceptable?
2. Students could also do a survey of their community to assess the community's opinion on pollution, and find an idea for a class environmental activity.

51. Climate Change Dodgeball

Contributed by Peace Corps/Peru

Objective: To learn how increasing amounts of greenhouse gases keep heat from escaping Earth

Ages: Middle

Materials: Crumpled-up paper balls

Time: 20 minutes

Procedure:

Divide the kids into two groups, with most of the kids in one cluster in the center and the others forming a circle around them. The kids in the center are the Earth, while the kids in the circle are greenhouse gases in the atmosphere. You are the sun outside the circle who throws "rays" in the form of crumpled-up paper balls at the Earth. The Earth kids repel the balls by throwing them out of the circle. The greenhouse gas kids try to catch or block the balls from leaving the circle and throw them back at the Earth. The round ends when all of your paper balls are outside the circle.

Since most of the kids are in the center, the first round should end quickly. In subsequent rounds, however, increase the number of kids in the circle, explaining that you are increasing the amount of greenhouse gases in the atmosphere. Do this each round, making it increasingly difficult for Earth to reflect the sun's rays. At the end, you can put one brave kid in the center for dramatic effect.

Discussion Questions:

1. What does this game demonstrate? (How increasing levels of greenhouse gases heat up the Earth because it's harder for the planet to reflect the sun's rays.)
2. Did it seem like the Earth was suffering at the end? What caused the greenhouse gasses to increase?
3. What can we do to prevent/mitigate human-caused climate change? What effects might we see where we live?

52. Climate Change Meltdown

Contributed by Peace Corps/Dominican Republic

Objective: To learn how greenhouse gases work to warm up Earth's climate

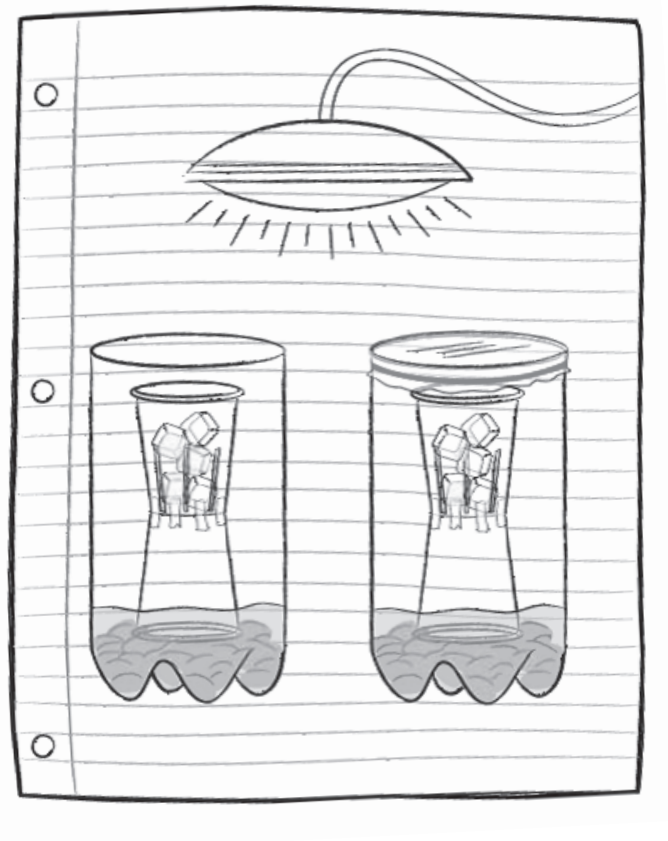
Ages: Middle

Materials: Sand or stones, two glasses of water, two empty plastic soda bottles with the top fourth cut off, four transparent plastic cups, clear plastic wrap, scissors, tape, rubber bands, strong sun, and ice cubes

Time: 30 minutes

Procedure:

This demonstration simulates the effect greenhouse gases have on Earth's climate. It works best if you have sufficient materials for pairs or small groups of kids to each construct their own simulation.



Courtesy of PC/Dominican Republic

First, to prepare the "islands" and "glaciers," fill each soda bottle with an inch or so of sand or small stones. Using scissors, cut four vertical slits in the bottom of each of two plastic cups; water will flow from these spaces. Place the cups with slits on top of the cups without holes, using tape to put them together without covering the slits. With the slit cup on top, place each pair of taped-together cups in a bottle, pushing the cups down into the sand or rocks to form a sort of "island." See diagram.

Now, pour water into each bottle until the water is an inch above the sand or stones. Water levels should be equal in the two bottles. Add equal amounts of ice in each slit cup (representing glaciers).

Cover one bottle with plastic wrap, holding it in place with a rubber band or tape. Leave the bottles in the sun. After 30 minutes or so, notice the changes in water level and amounts of ice in the two bottles.

Discussion Questions:

1. In which bottle did the ice melt faster? Why? (The ice melted faster in the covered bottle because the heat was trapped.)
2. Which model demonstrates the greenhouse effect? (On our planet, the heat of the sun is trapped by the atmosphere and greenhouse gases, like the covered bottle.)
3. If they were real "islands," where would you like to live? Why?
4. If climate change causes more rapid melting of the glaciers on land, what do you think will happen to ocean levels? (Ocean levels can be expected to rise, and many coastal cities will become submerged by water.)

53. Drawing Your Favorite Place

Contributed by Peace Corps/Cameroon

Objective: To heighten awareness of environmental problems and the need to do something to address them

Ages: Young, middle

Materials: Paper, drawing and/or painting implements (e.g., pencils, crayons, markers, paint and brushes)

Time: 30 minutes

Procedure:

In this straightforward activity, distribute paper and art supplies to your kids and ask them to draw their favorite place outside, either through their imagination or their direct experience. Then ask them to mess it up by adding environmentally detrimental human activities they know of, such as litter, pollution, factories, lumber cutters, wildlife poachers, etc.

Discussion Questions:

1. Why is this place special to you?
2. How do you feel about it being messed up? If it looked like this, would you ever visit it again?
3. Have you seen these activities yourself, or have you heard about them? Where?
4. Can we as individuals or as a group do something about these activities in our community? What do you suggest? How will this help the people in the community?

Variation:

Kids can draw what they think would be a model town. Ask them to consider:

1. How they can make the town attractive (trees, plazas, gardens, roads, streams, etc.)
2. Where they will be depositing the town's wastes (food scraps, plastic, etc.)
3. What people's houses and yards will look like
4. What kind of stores and shops the town will have
5. What kids and adults will be doing
6. What the schools will look like
7. Where the kids will play and the adults will relax
8. What kinds of domesticated and wild animals will and will not be present

Once the kids are done, ask them if they could help their own community improve along the lines of their thoughts.

54. Fishbowling Debates

Objective: To learn different points of view about environmental issues, thereby developing more informed personal opinions

Ages: Middle, older

Materials: Four or five chairs

Time: Depending on kids' ages, 15–30 minutes

Procedure:

Debates can help kids express and develop their points of view, while strengthening their critical-thinking and communication skills. The best debates focus on a question that does not have obvious right and wrong answers and have opinions on both sides that are well-represented by your cohort of kids. Debates that feature a large group of kids ganging up on a few won't be much fun.

Fishbowling can effectively encourage widespread debate participation and establish an environment where kids actually listen to each other. Prior to the debate, select a topic and, if your kids are unfamiliar with it, review its main points, especially the different opinions people have about the topic and why. Once the kids are sufficiently informed, set up four or five chairs in a circle, and ask kids to volunteer to sit in them to begin the debate. Make sure that different points of view are equally represented by kids who are roughly equal in their ability and willingness to express themselves. One side with aggressive and eloquent kids faced off with another with quiet and intimidated kids won't be very interesting. The rest of the kids situate themselves around the debate circle.

One seat in the circle is always left open. This is the "Hot Seat." The kids who are listening to the debate can, when they feel so moved, get up and sit in this seat. When an opening appears, they can express their opinion and then, as soon as possible, vacate the seat for someone else. This tactic encourages the spectator kids to stay engaged in the debate.

Periodically, and one by one, replace the kids in the original circle with others who want to participate. Make sure you stagger when you do this, so that all the kids in the circle don't get up at once. You will probably want to keep the most active and engaged kids in the circle longer than the others to keep the debate going. Be sure to continually monitor the action so that kids are respectful to each other and don't get too rowdy. Continue until you feel the debate has run its course.

55. Fortune-Teller

Adapted with permission from Zoomy Zoomy*, by Hannah Fox (Tusitala Publishing)*

Objective: To consider the possible future of plants, animals, and people and how to make it promising

Ages: Young, middle

Materials: None

Time: 20–30 minutes

Procedure:

This fun exercise engages kids in thinking about the future and what can be done to make it bright.

Tell the kids that they are going to have the chance to be a great fortune-teller and to predict the future. They will also have the opportunity to have someone tell them about their future. Instruct the kids to choose a partner and decide who will be the fortune-teller first. Kid A will be the fortune-teller, and Kid B will represent him- or herself, another person, or an animal; you can tell Kid B who or what they are, or let the pairs choose. Each fortune-teller then spends five minutes telling Kid B his or her (or for an animal, its) fortune. Encourage the kids to be fanciful and playful with the exercise and to allow any offbeat or silly ideas to emerge.

Discussion Questions:

1. How did your futures look?
2. How realistic do you think they are, considering your roles and the futures your characters face in real life?
3. What could be done so that their futures will be bright?

56. Gifts From the Earth

Contributed by Peace Corps/Armenia

Objective: To identify the natural source for the materials in common products

Ages: Young, middle

Materials: Paper and writing utensils

Time: 20 minutes

Procedure:

Show the kids a "gift from the Earth"—for example, a pencil or crayon—and ask them what that item is made from (wood, wax). Ask them where wood and wax come from (trees, fossil fuels). Repeat with any other objects you have handy (a book, cardboard, glass, honey, an item of clothing, etc.). Point out that the sources of the materials used to make items that people want are natural resources. Now ask the kids to draw an item of their own and diagram the natural resources that went into producing the item. For example: pencil – wood – trees – air, soil, water, and sun. Once the kids have finished, ask them to share their "gifts from the Earth." Point out what might be missing from the diagrams (e.g., air, sun, water, soil).

Discussion Questions:

1. What would happen if we lost these natural resources?
2. Are any of these being lost as a result of human activity?
3. What do we need to do to ensure that sufficient resources will be around for future generations?

As a follow-up, the kids can make signs for the objects in classrooms or other common spaces that illustrate the resources from which the objects were made.

57. Greed vs. Need

Contributed by Peace Corps/Armenia

Objective: To learn what can happen to a commonly held resource (e.g., a grazing area, forest, or fishery) without careful management

Ages: Middle, older

Materials: Popcorn, nuts, or candies

Time: 20 minutes

Procedure:

Begin by dividing the kids into teams of four. Give each team 16 pieces of popcorn, nuts, or candy. Explain to the kids that they will play a game in which the popcorn represents the team's supply of a renewable resource (e.g., fish, trees, wildlife, grass for livestock) that is replenished after each round of play. Each kid can take freely from the team's supply. The team should follow the rules:

- At the end of the game, each team member will get to eat all the popcorn that he or she has amassed.
- Each team member needs to take and eat at least one piece per round to be sustained.
- At the end of each round, the resource will be replenished by half the existing amount.

Begin the game by, in the first round, allowing the kids to take freely from their team's popcorn pile (every kid has to take at least one). Kids should record how many pieces they have taken and how many are left in the team pile. Now find out how many pieces each group has in its central pile, and give each half that amount in new pieces. Play three or four more rounds, stopping after each to find out if any of the kids didn't "survive." Then provide each group with the prescribed amount of new popcorn.

After four or five rounds, have the kids share what happened in their teams. In which teams did all the students survive? Which kids have the most popcorn in their personal supplies? Which team had the most popcorn in its collective pile? Which teams think they would be able to keep eating popcorn forever as long as the resource kept renewing itself? On these teams, how many pieces were these kids taking each round?

Discussion Questions:

1. What are the advantages and disadvantages of using a resource in a sustainable way? (Advantage: It can last forever. Disadvantage: You need to control your use of it.)
2. What are the advantages and disadvantages of using a resource in an unsustainable way? (Advantages: People will have a large amount of the resource available when they want it; they can make a lot of money in the short term. Disadvantage: They can destroy the resource base for themselves and future generations.)
3. In this demonstration, the population of each group stayed the same. In reality, however, the human population is increasing rapidly. What would have happened if one or two additional people had been added to your group?

Variation:

This variation features fish as the commonly held resource. This time, introduce the ground rules, supplying only the information needed to get the kids started. The dilemma should surface as the outcome of the activity.

Divide kids into groups of four and give each a bowl with 16 "fish" (popcorn, nuts, candies, etc.). The objective is to harvest as many fish as possible from the sea. At carrying capacity, there are 16 fish in this sea. For every four fish each kid harvests, he or she will receive one point. When the game begins, each kid may harvest all of the fish, some of the fish, or none. The kids will have four 20-second rounds in which to harvest fish. Notify them when to start and stop each round. If fish remain in the sea after each round, a new fish will be added for each one remaining. If there are four fish left, four more will be added. But for each new round, the total number of fish in the sea cannot exceed the carrying capacity of 16 fish. Repeat the demonstration with eight kids in each group to simulate population growth. Keep all other factors constant.

Discussion Questions:

1. What was the maximum number of points achieved by any individual? Any group?
2. Why were fish only replaced if some remained in the bowl after each trial? (Simulates natural conditions; if all fish are harvested, no additional fish will be born.)
3. What happens when members of a group do not use a cooperative strategy?
4. What was the best strategy for harvesting from this common resource? (Eight from each trial.)
5. Stewardship of a resource is demonstrated when we use a cooperative strategy that shows concern for a resource. Name other resources that require our stewardship.
6. How will continued population growth affect our stewardship of the Earth's resources?

58. Our Promise

Contributed by Peace Corps/Dominican Republic

Objectives: To focus environmental club members on the environment; to inspire members to carry out environmentally sound personal behaviors

Ages: Young, middle

Materials: Flip chart paper, large sheet of cardboard, or cloth; markers; paint for thumb or handprints (optional)

Time: 15 minutes

Procedure:

Gather the group of kids and ask them to prepare a list of environmental behaviors that they will commit to follow as best they can. You can title the paper, cardboard, or cloth flag "Our Promise" and include a subtitle such as "We promise that we will protect our environment." You can start each action idea with "We will..." It's best to keep the promises positive, as in "We're going to throw trash in the trash can," versus "We will not throw trash on the ground." To complete the activity, each kid can sign their name, or kids who can't write yet can draw something to represent themselves. They can also add a thumb or hand print. This commitment may be posted wherever the group meets.

59. Past and Future

Adapted from 101 Nature Activities, *with permission from Sanborn Western Camps*

Objective: To encourage kids to reflect on the environmental issues confronting their communities and what they might do to address them

Ages: Middle, older

Materials: Paper, drawing materials, flip chart

Time: 30–45 minutes

Procedure:

This is a quiet activity during which kids visualize what their community used to be like and what it will look like in the future. Gather the kids in a place that encourages reflection, such as a shaded garden, and ask them to share what the community might have been like 100 years ago. How would the community have been different, and how would it have looked the same? Record their answers on a flip chart. Now ask them, based on current trends, what they think the community will look like 100 years from now. Write their answers down. You can also ask the kids to divide up into groups of two to three and sketch their community 100 years in the future. What do they think will be positive and negative changes? What will be the state of the community's air and water quality, trees, and overall appearance? Will more or fewer people live in the area? Will they have jobs and be healthy? What issues will have to be addressed, and how can the kids help resolve them, either now or in the future? Record their thoughts on the flip chart.

60. Personal Environmental Action Survey

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objective: To learn personal actions that kids can take to improve the quality of their environment

Ages: Middle, older

Materials: Paper, writing utensils

Time: 30 minutes

Procedure:

In this exercise, kids take personal surveys about their environmental habits. Prior to the exercise, prepare a list of personal environmental behaviors that the kids in your group can do, either all "good" or both "good" and "bad." An example:

1. Yes___ No___ When I see trash that someone else has thrown on the ground, I usually leave it there because I didn't put it there.
2. Yes___ No___ I separate recyclable materials, such as aluminum cans and plastic soda bottles, from ordinary trash to recycle them.
3. Yes___ No___ I sometimes throw trash on the ground.

4. Yes___ No___ I pick up trash I find on the ground even though I did not put it there.
5. Yes___ No___ I put nonrecyclable trash into containers.
6. Yes___ No___ I am kind to animals I see in the community and do not try to hurt them.
7. Yes___ No___ Sometimes I hurt and bother animals in the community, especially ones I don't like.
8. Yes___ No___ I stay away from animals I see in the community that might hurt me.
9. Yes___ No___ I don't pick flowers in the community so other people can enjoy them.
10. Yes___ No___ I help compost our food scraps.

Once the kids are done, tally up the responses.

Discussion Questions:

1. Which activities are "good" for the environment? Which ones are "bad"? Why?
2. Looking at this list, can you think of any actions you would like to do more or less? What might be standing in your way and making it hard to do this?
3. Which activities do you think people in the community commonly do? Which ones do people not do, as a rule?
4. Are there any activities that you think the group should encourage the community to do or not do? How might we do this? What might be some reasons people aren't doing what you think they should, and how do you think you might be able to overcome them?

Variation:

Ask the kids to come up with their own list of environmental actions for the survey.

61. Popcorn Generation

Contributed by Peace Corps/Armenia

Objective: To learn what happens to nonrenewable natural resources over time

Ages: Middle, older

Materials: Large jar full of popcorn, nuts (watch out for kids' allergies), or candies; 14 slips of paper, container to put them in; 14 lunch bags

Time: 20 minutes

Procedure:

Fill a large jar with popcorn, nuts, or candies. Mark 14 slips of paper as follows: Two "1st Generation," four "2nd Generation," and eight "3rd Generation." Put the slips into a small container. Have 14 kids each draw a slip of paper from the container. They should not tell anyone what the paper says. Give each kid a lunch bag and explain that they will be part of a demonstration.

Ask the two 1st Generation kids to come up to the big jar of popcorn. Explain that the food in the jar represents the world's supply of a nonrenewable resource, such as a mineral or petroleum. Tell them they can take as much of it as they want. Let them fill their bags while the rest of the group watches. When the 1st Generation kids have gotten their fill, invite the four 2nd Generation kids to go up and take as much of the remaining popcorn as they want. After they've finished, have the 3rd Generation kids come up and take what's left.

Discuss with the kids what is happening to the world's popcorn supply. What happened to the total amount of the resource? How much was left for each successive generation? Was anything left for a fourth generation? Did any of the kids who were part of the demonstration think about those who might be eating after them, or were they only trying to get as much popcorn as they could? What parallels do the kids see between what happened in the demonstration and what happens in the real world?

The kids should realize that as new generations come along, there will be less and less of the resource available to them, and eventually there will be nothing.

Discussion Questions:

Have a kid explain what renewable and nonrenewable resources are. Then ask:

1. If a resource is renewable, does that mean it will continue to exist no matter what people do? Explain your answer.
2. What two factors would you say are most important in determining how fast natural resources are used? (This question may be difficult for some kids. By recalling the demonstrations, though, they should be able to deduce that the number of people using a resource and the amount each person uses are very important in determining how fast resources get used.)

62. Red Light/Green Light

Contributed by Peace Corps/Dominican Republic

Objective: To learn some human activities that help and hurt the environment

Ages: Young

Materials: None

Time: 15 minutes

Procedure:

This game reviews issues that help and harm the environment. Line up the kids in a row next to a wall and stand in front of your students. Say an action that can be either good or bad for the environment. If the kids think it's a good action, they take a step forward; if they think it's a bad one, they stay in place. For example, if you say "throw garbage in the street," nobody is going to take a step forward. If a student moves at the mention of a bad thing, they have to go back one step from where they started. Continue the game until a kid reaches you and wins the game.

63. Role-Playing

Adapted from Environmental Education in Schools (Peace Corps Publication No. M0044)

Objectives: To better understand why people can disagree about environmental issues, and to be introduced to ways of compromising to bring such issues to a satisfactory resolution

Ages: Middle, older

Materials: Paper, means of writing and copying (optional)

Time: 30 minutes

Procedure:

In role-plays, kids step outside their own personalities and try to put themselves in other people's shoes. By taking on specific roles and trying to make decisions based on those roles, kids can better understand the different sides of issues, why people can disagree about their solutions, and how people can work together, often compromising, to resolve issues in a satisfactory way.

It's important to realize the limitations of role-plays. Even when information is supplied, kids cannot realistically take on another person's role completely. So you can't expect a kid playing a role to act in the same way a real person in that situation might act. What role-plays can do is help kids gain perspective and appreciate the complexity of environmental problems.

To set up a role-play, first come up with an environmental issue that can feature different points of view. For example, if the issue is wildlife poaching, the participants can be poachers, national park rangers, ecotourism operators, people in the community, officials from the national government, people who buy and sell the poached items, and international conservationists. Whatever the issue, you will need to do the following:

- Try to summarize the interests and concerns of each individual to help each kid get into his or her role. Most likely, you will want to write down brief character summaries on sheets of paper or index cards.
- Once the kids get their character summaries, give them a few minutes to think about their roles (Putting the kids in pairs can help them process their challenge.):
    - How their characters feel about the issue
    - How they will express their opinions in a public forum
    - What they think the personality of their character might be
- Set up chairs in a circle or around a table so the kids can see each other. Tell them that they are now participating in a town/regional/national/international meeting to share ideas as to what to do about the issue you have selected. The kids can question the speakers, but be ready to calm everyone down and prevent things from becoming antagonistic and angry. The kids can really get into their roles! You may need to remind them that they are just pretending.

- Once everyone has been heard from, moderate a discussion as to what might be done to resolve the issue, taking into account, but not necessarily acceding to, the desires and needs of the participants.

Examples of role-plays may be found in Peace Corps manuals *Environmental Education in Schools* (No. M0044), pp. 133-158, and *Super Saver Investigations* (No. FC155), pp. 377-379.

64. Two Different Communities

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objectives: To help kids realize the environmental issues confronting their communities and to encourage them to visualize how to address them

Ages: Young, middle

Materials: Paper, drawing utensils

Time: 30–45 minutes

Procedure:

In this activity, kids draw two communities: one suffering from obvious environmental problems stemming from poor environmental practices, and one in which people are managing their environment wisely and therefore avoiding environmental problems.

Organize the kids into small teams and give each team a list of both good and bad environmental practices. Ask them to draw one community where the bad practices are found and another with the good practices.

Discussion Questions:

1. Why are these bad practices "bad"? What harm are they doing?
2. Why are the good practices "good"? Why are they better than the "bad" practices?
3. Which practices, good and bad, have you noticed in the community? Please describe them.
4. Do you have any ideas how we can get more people to adopt "good" environmental practices?

Here are two possible scenario examples:

1. Soil and Water Management:
   a. Good practices to illustrate:
      i. Plowing on the contour; strip-cropping
      ii. Windbreaks

iii. Terraces

iv. Planting trees

v. Streamside buffer zones of vegetation

vi. Livestock fenced away from streams

vii. Compost piles for gardens

b. Bad practices to illustrate:

i. Plowing up and down hills

ii. Cutting trees on slopes

iii. No vegetation buffer strips separating a stream from bare fields

iv. Livestock trampling through the stream

v. Bare, flat fields, perhaps with wind blowing soil

vi. Gullies running down slopes

2. Solid Waste Management:

a. Good practices to illustrate:

i. Feeding food scraps to chickens

ii. Composting food scraps and livestock manure

iii. Recycling, and making crafts out of, plastic bottles and plastic bags

iv. Putting litter into trash cans

v. Emptying water from containers and old tires that can serve as mosquito breeding grounds

vi. Fences keeping dogs and rats away from dumps

vii. Having a latrine

b. Bad practices to illustrate:

i. Littering (trash, broken glass, food scraps, garbage)

ii. People being injured by broken glass or metal cans

iii. Throwing food scraps onto garbage heaps

iv. Burning plastic bottles and other trash

v. No trash cans around

vi. Dogs and rats roaming through garbage; swarms of flies

vii. No latrines

Variations:

You may prefer to draw the communities yourself and ask the kids to identify the good and bad practices in each. Or mix good and bad practices into the same picture or pictures and ask the kids to see if they can tell what they are. Young kids may want to color your drawings.

65. When They're Gone, They're Gone

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objective: To learn the importance of conserving nonrenewable natural resources, recycling and reusing them whenever possible

Ages: Middle, older

Materials: Colored beads or the equivalent (e.g., 400 red, 104 blue, 31 pink, 12 green, 1 orange, 1 yellow, 1 purple, 1 clear), small containers such as plastic cups

Time: 20 minutes, plus time for hiding beads

Procedure:

Before the activity begins, hide the beads wherever the kids are going to gather (e.g., a classroom, school, neighborhood center, playground). The different-colored beads (or equivalent) represent the relative abundance of different (nonrenewable) mineral resources; thus:

- 400 red beads = iron in ore
- 104 blue beads = bauxite (aluminum ore)
- 31 pink beads = chromium
- 12 green beads = copper
- 1 orange bead = lead
- 1 yellow bead = tin
- 1 purple bead = silver
- 1 clear bead = platinum

Once the kids have arrived, begin by making sure they understand the difference between renewable and nonrenewable resources. Ask them to give examples of each. (Renewable: plants, wildlife, fish, soil, water. Nonrenewable: minerals, fossil fuels.) Now explain to them that you have hidden beads of different colors that represent the abundance of different minerals on the planet (not the ease with which they can be extracted). Divide the kids into teams; give them two minutes to search for the beads, then return to home base. (If you want to illustrate that countries vary in their capacity to find minerals, create uneven teams: e.g., the United States and Russia, six players each; Europe, four players; Japan, three players.) Ask them to repeat the search, but for only one minute. Have the kids tally their beads. Why was it

more difficult to find beads the second time around, and what does this suggest about people searching the planet for minerals? Is throwing away things that are made from nonrenewable resources, like metal cans, a good idea? What can people do to extend the life of nonrenewable resources? (Reuse and recycle.) Considering the future, why is this a good idea?

Nature Awareness Activities

Nature Awareness Activities

66. Blind Trail

Adapted from Sharing Nature With Children

Objective: To increase ability to detect natural phenomena

Ages: Young, middle

Materials: Rope or string, blindfolds

Time: 20–45 minutes, depending on length and characteristics of trail

Procedure:

This is a trail that blindfolded kids can follow by moving along a rope or string. You can affix the string or rope to trees, fence posts, the ground, and interesting objects, and you can tie knots along the way to indicate areas of interest. You can also attach offshoot strings to add elements of mystery to explore; participants can then return to the main string. Setting is important, so take time to find areas that can provide a variety of experiences where kids can use all of their senses. The trail can move, for example, from a shaded to a sunny environment, or from a wet to a dry one, with bees, trees with bark of different textures, fragrant flowers, and different types of soil along the way. A good blind trail may take a while to set up using smooth and rough rocks or dry, crackly ground, cool water, or rich aromas.

Tone setting is important so that kids begin while calm and reflective. Indicate which side of the string or rope students should remain on, and ensure that the trail is devoid of dangerous plants, animals, insects, and physical obstacles. Encourage silence, perhaps beginning by sharing a leaf to smell or a rock to touch, thus showing the kids how to approach the activity.

67. Budding/Becoming a Mushroom

Objective: To increase awareness of blooming flowers and fruiting mushrooms

Ages: Young

Materials: None

Time: 10–15 minutes for each role-play

Procedures:

In the budding exercise, young kids imagine they are flowers about to bloom. Have everyone sit in a circle, and then turn everyone around so they are facing out. Now they become like the bud of a flower or leaf. They should start by pulling in knees and arms and hunching over, all curled up into a tight ball. Then they should slowly, slowly open to the sunshine and gradually unfold. They should shake their heads, loosen their shoulders, and stretch.

In the becoming-a-mushroom exercise, the kids bury themselves in piles of leaves. Then, first one finger on each hand pokes up through the layers, and then one more finger at a time until the whole hand pops up. Then the arms spring up; a head pokes through. Finally, like a mushroom on a warm day after the rain, they come bursting out from the Earth.

68. Get in Touch With Nature

Contributed by Peace Corps/Armenia

Objectives: To develop ability to observe nature and to distinguish different plants and other natural phenomena

Ages: Young

Materials: A shoebox or other medium-sized box, natural objects and collection materials for each group of students, collecting bags (clean socks can serve as well)

Time: 30–45 minutes

Procedure:

Collect different natural objects from the ground (e.g., leaves, bark, nuts). Cut a hole in the top of your box, the size for a hand to fit through, and place the items you collected into the "Mystery Box." Bring your Mystery Box and the kids to the area where you collected the materials. Give each kid a bag for collection, and then have them each feel inside the Mystery Box. Ask the kids to find the things they felt in the box in the area around them. After they have collected their items, gather them together. Pull out one item from the Mystery Box and have students hold up their object that matches.

Variation: Mystery Bags

Put several different objects commonly found on the forest floor into separate bags, and pass them, one at a time, halfway around a circle of kids. Each kid feels the object and gives an adjective describing it. The other half of the circle tries to guess the bag's contents. The last kid gets to reveal the object. Reverse the order so that everyone gets the chance to guess and to feel. Have the older kids arrange the objects in the order of decomposition rates. This might initiate considerable discussion, as there will probably be more than one possible order.

69. Make a Nature Corner

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objectives: To find and learn about the plants, animals, soil, and other natural phenomena in your community and to educate others about them

Ages: Young, middle, older

Materials: Examples of nature found in your community: e.g., leaves, fruits, flowers, bones, rocks, and soil samples; exhibit table; art supplies for making posters and signs; other craft materials depending on the type of exhibit to be created

Time: Depends on the time required to collect the natural materials and construct the exhibit

Procedure:

If you have a classroom or community center available, you can create a nature corner. Some exhibit ideas include a "What is it?" shelf, bulletin board, or bookshelf; a matching exhibit where people can match names and pictures of animals or trees with something related to

them (e.g., pictures of birds with pictures of tracks, feathers, nests); names and pictures of trees with something related (e.g., leaves, fruit, wood samples). Other items you can include might be live animals, especially insects; bird houses; mounted feathers; animal-gnawed things; snake skins; pressed flowers, leaf prints, twig and seed collections; containers of different types of soil; and local rock samples.

70. Making an Ant's Nature Trail

Objective: To develop skills for observing nature's details

Ages: Young

Materials: Index cards, pencils, twigs, tape or glue, pieces of string 2 yards long

Time: 30 minutes

Procedure:

Divide the kids into pairs, and give each the materials listed above. Have each pair make a nature trail as seen from an ant's point of view. Lay down the string to delineate the trail. Interesting points along the trail, such as the tallest blade of grass or boulders (which look like pebbles to humans) are described with signs made on small cards attached to the twigs and stuck in place. Upon completion, the kids should visit the other ant nature trails.

71. Making an Elf's Village

Objective: To develop skills for observing nature's details

Ages: Young

Materials: Objects from nature: twigs, leaves, pebbles, moss, etc.; index cards, pencils, tape or glue

Time: 30 minutes

Procedure:

In this activity, young kids use their imaginations to create a little village for ants, elves, or other diminutive creatures. Using natural objects that they find themselves, or that you provide for them, the kids, in pairs, teams, or individually, construct tiny roads, houses, swimming holes, canals, playgrounds, plazas, and signs (which you may have to write for them on index cards if they can't write yet). After they are done, they should give their village a name and invite the other kids to visit.

72. Nature Bingo

Adapted from 101 Nature Activities, *with permission from Sanborn Western Camps*

Objective: To develop skills for observing nature's details

Ages: Young, middle

Materials: Paper or poster board, drawing utensils

Time: 30 minutes

Procedure:

This adaptation of a familiar game encourages kids to look closely at nature. Before the activity, scout an area and make a list of natural objects that can be found there. Now give each kid paper on which to draw a bingo board—five squares across and five squares down, with a free space in the middle. Ask the kids to write the names, or draw pictures, of the natural objects that you are going to ask them to find in random squares on their paper. Now ask the kids to go and find the objects to place on their corresponding squares. The first kid to complete a five-square line across, down, or diagonally is the winner.

73. Nature/Interpretive Trails

Objective: To teach a wide range of environmental topics

Ages: Young, middle, older

Materials: Whatever is available for signs, trail guides, maps, bulletin boards (e.g., wood, paper, drawing materials, natural objects); materials for trail surfaces, such as sawdust, wood chips, and rocks and boards for crossing wet spots; tools for making signs and clearing trails

Time: Depending on the trail's length and themes, typically several days or weeks to plan and construct; 30–60 minutes to experience

Procedure:

Nature/interpretive trails represent an attractive alternative to guided nature walks. Participants walk a trail and make designated stops that highlight the concepts the trail is intended to illustrate. These stops may be interpreted by printed trail guides, maps, or signs made from anything from 3x5 index cards wrapped in cellophane to wood and plastic. You can lay out the trails in a variety of places: public parks, nature reserves, schools, government buildings, and even villages. The subjects you want to focus on will, in large measure, determine where you situate the trail.

Nature/interpretive trails have the advantage of being able to communicate with people without requiring your presence. Their construction can also be an engaging and educational service project for kids and community residents. Their disadvantage, compared with guided nature walks, is that they can require an initial investment of time, finances, and materials and can easily fall victim to vandalism and disrepair, thus requiring constant maintenance.

A well-constructed nature trail should:

- be clear of exposed roots, rocks, and stumps so people won't trip and fall;
- be wide enough to accommodate small groups of people and to prevent them from being in contact with spiny plants and poisonous snakes;
- be cleared of tall grass and invasive shrubs, which, in the tropics, can invade open trails very quickly;
- provide the means by which people can avoid muddy spots (boardwalks, rocks, wood chips, etc.);
- provide resting spots, such as benches, logs, or large rocks for elderly and tired visitors;

- provide receptacles for litter;
- provide maps, either posted on a bulletin board at the beginning of the trail or in print form; and
- avoid straight lines, but instead, loop and wind through the area to provide a sense of seclusion and an element of surprise.

Signs and interpretive stops can take a variety of forms. Enclosed wooden boxes can hold hidden natural items to smell and touch. Signs can feature hinged flaps; a question can be written outside the flap, and visitors can then raise it to find the answer underneath. Wooden signs can be carved into the shapes of leaves or animals.

This is only a brief introduction to nature/interpretive trails. For further discussion, refer to Peace Corps manual M0075, *Environmental Education in the Community*, pp. 191-211.

74. Nature Rubbings Game

Adapted from 101 Nature Activities, *with permission from Sanborn Western Camps*

Objective: To develop skills for observing nature's details

Ages: Young

Materials: Paper, crayons or pencils

Time: 30 minutes

Procedure:

Prepare a collection of nature rubbings by finding natural surfaces, such as different kinds of tree bark, rocks, leaves, and shells; placing a sheet of white paper over the surfaces; and gently rubbing the paper with either a pencil or, preferably, a crayon. Give each rubbing a letter or number, and post them on a wall. Now, give each kid or pair of kids a sheet of paper and a pencil or crayon. Ask the kids to write the letters or numbers down the left side of the paper. Ask the kids to now explore the designated area where the natural surfaces portrayed in the rubbings can be found. The game is to find and identify the sources of the rubbings, writing their answers down next to the letters or numbers corresponding to the rubbings (e.g., "A" = the tall tree in the corner of the schoolyard). Award points for finishing first (3 pts.), second (2 pts.), and third (1 pt.), one extra point for each rubbing correctly identified, and one point deducted for every wrong answer. You can also ask the kids themselves to make the rubbings for the game. Each kid will only know the rubbings he or she has made, so the game can still work (as long as the kids don't tell what the rubbings are!).

75. Nature Sculptures

Adapted from 101 Nature Activities, *with permission from Sanborn Western Camps*

Objective: To increase observation and appreciation of natural phenomena

Ages: Young, middle, older

Materials: Whatever can be found outdoors; internet access and cameras also very helpful

Time: 30–60 minutes; however long it takes to conceive of a project, find the materials, and make the sculpture

Procedure:

Kids can make nature sculptures, using practically any materials found outdoors. To inspire the kids and show them what's possible, if you have internet access, find and show the kids pictures of the sculptures of Andy Goldsworthy. This artist creates beautiful works of art using a huge variety of natural objects. Once the kids have made their creations, photograph them, as they will likely decompose over time. You can also organize a community gallery walk through the area where the kids have made their sculptures.

76. Press Conference

Adapted with permission from Zoomy Zoomy, *by Hannah Fox (Tusitala Publishing)*

Objective: To learn interesting facts about nature

Ages: Young, middle

Materials: None

Time: 20–30 minutes

Procedure:

In this activity, a kid volunteers to be the "celebrity" and leaves the group. While the celebrity is gone, the rest of the kids decide the plant, animal, or environmental person (farmer, park ranger, etc.) the celebrity will be. The celebrity returns to the group without knowing who he or she is. The rest of the kids are now members of the press holding a press conference and will ask the celebrity leading questions. The celebrity answers the questions as if they know who they are. For example, if the celebrity is a mouse, the kids can ask, "Is it hard to brush those teeth?" or "Why are your ears so big?" The celebrity might answer, "Sometimes it's hard" or "So I can hear well!" Discourage the kids from asking questions that are too specific and that eliminate the fun of the guesswork. Keep the game going until the celebrity figures out who he or she is.

77. Rocks, Plants, and Animals Memory Game

Adapted from Sharing Nature With Children

Objective: To increase awareness of natural phenomena

Ages: Young, middle

Materials: Bandanna or large cloth, various natural objects

Time: 20 minutes

Procedure:

Before the activity, secretly gather 10 objects from the natural surroundings. Lay them on a surface and cover them with a bandanna. Gather the kids to observe the objects under the bandanna for about 30 seconds, prompting them to remember everything they see. Next, ask the students to spread out and collect identical items in their immediate environment for 10 minutes. When they are finished, present each item one by one, seeing if they were able to locate it, and perhaps sharing an anecdote or interesting fact about each one. This is a good icebreaker to go into more detail about anything in their natural environment (e.g., with different seeds, leaves, and fruits, you can then talk about tree nurseries and reforestation).

78. Sitting in Silence

Objectives: To develop skills for connecting with nature; to encourage reflection about nature, its importance to humans, and how humans should treat it

Ages: Middle, older

Materials: Journals and writing utensils (optional)

Time: Depending on the ages and activities, 15–60 minutes

Procedure:

Sitting in silence, alone or in a group, allows kids to notice aspects about nature that they wouldn't otherwise. Silent reflection can also inspire kids to think about nature, why it is important to them, and what they might want to do to protect it.

To sharpen their ability to notice nature, gather the kids and ask them to do the following:

- Notice how natural objects smell. Ask kids to hold things up to their noses, crumble and crush leaves and bark, and moisten things before smelling them. Encourage them to trace smells to their sources.
- Notice how natural objects feel. Ask kids to briskly and rapidly clap their hands together, which sensitizes them. Encourage them to touch things with their cheeks and the insides of their arms, which are especially sensitive to touch.
- Notice how natural objects look from different perspectives. Ask kids to frame objects with their hands, joining fists together to make a tubular frame like a telescope, or using thumbs and index fingers to make a square "picture" frame. Show them how to move the frames closer or farther away from their eyes.

- Notice small things. Ask kids if they could pick out the object they are looking at in a pile of 20 other objects just like it.

After the kids are sensitized, you can ask them to take time to be silent in nature either alone or in a group. If the kids are to be alone, gather the kids and walk along a trail, stopping every few minutes to drop a kid off in an inviting spot, until you have all of the kids spread out and out of sight and earshot of each other. Tell them how long you would like them to be silent and alone and that you will come back to retrieve them after that time. Also, assure them that you are nearby and that they can yell if they encounter an emergency.

Once the kids are situated, they should notice everything they can, recording their impressions. Asking them to write down their impressions, perhaps in a journal, will help them remember what they have noticed, thought, and felt. Following the silent reflection, round the kids up, sit them in a circle, and ask them to share their experiences:

How many colors did they see? How many shades of green and brown? What did they see and smell lying on their backs? Looking up, what did the spaces between tree branches look like? How many sounds did they hear, and what made them? How did different tree barks and other objects feel to the touch? What insects and other animals did they see, and what were they doing? Did they notice the wind or how being in the shade and sun felt? What did they wonder about nature? Did they hear, see, smell, or touch something new? Any "a-ha" moments? What did they wonder about nature, humans' place in it, and how they might help protect it? If they were to lead this activity, where would they choose to go?

Kids can also engage in silent reflection as a group. Find a comfortable spot outdoors and ask the kids to sit in a circle, with their feet toward the center. They might lie on their backs if the sun isn't too bright. Once everyone has settled down, the kids might speak out of the silence with observations or thoughts they would like to share. To stimulate thinking, you might introduce the activity with a thought-provoking question for the kids to contemplate or use some of the questions provided above.

79. The Sound of Silence

Adapted from Sharing Nature With Children

Objective: To increase skill in noticing nature by moving silently and staying alert

Ages: Young, middle

Materials: Blindfold, rock

Time: 20 minutes

Procedure:

One blindfolded kid plays an old, blind miser protecting his or her treasured rock worth $100 million. The other kids begin about 30 paces from the miser in a circle around him or her. When this person falls asleep (which is bound to happen), the kids must stealthily approach the miser barefooted (preferably) and steal the rock. If the miser hears anyone, he or she will point in the direction of the sound, and that kid will then be frozen. This may require a referee. If too many people are frozen, they can be asked to start back at the beginning. You can reduce the distance if there's noisy ground cover. Afterward, the kids can be asked to share what they heard while participating in this otherwise silent activity. This can be done at night with the miser using a flashlight instead of pointing.

Courtesy of PC/Fiji

80. Take a Hike: Nature Walks

Objective: To increase appreciation for and understanding of natural phenomena and processes

Ages: Young, middle, older, depending on the type and topic of the walk

Materials: Dependent on activity (e.g., magnifying glass, a book to press flowers or leaves in, a bag to collect litter)

Time: Dependent on activity

Procedure:

Guided walks, during which a leader points out phenomena and discusses them, can focus on a wide range of topics, including the following:

- Animals and their habitats, habits, and signs (homes, nests, tracks, markings, droppings, chewed leaves and other evidence of eating, etc.). Animals can range from birds and mammals to tiny insects and other invertebrates.
- Identification, natural history, human uses, folklore, and ecological significance of trees, flowers, medicinal plants, and edible plants, etc.
- Ecological processes (rotting logs, mushrooms and soil creatures breaking down leaves and creating soil, erosion, plant succession, pollination, fruit dispersal, etc.)
- Nature awareness and discovery (sounds, smells, textures, colors, shapes, etc.)
- Human impact (sound and unsound environmental practices: e.g., forestry, gardening, soil conservation, litter, erosion, pollution)

Of course, you will need to decide on a theme and plan your route beforehand. If you are guiding people in a line, move back to the middle of the line when you have stopped to point something out.

Speaking to a group of people and expecting them to listen attentively is more appropriate for older people, including adults, as kids are often too restless for this approach. Thus, you can try variations of the guided walk, including these:

- **Nature Far and Near:** Make a list of 20–30 items to be found along a route, with a score for each: e.g., bird's nest, 10 points; animal track, 15 points; orange butterfly, 5 points; flying crow, 10 points. The first kid to call out the item scores.
- **Blind Walk and Caterpillar Walk:** You can do this in different ways:
    - Pair the kids up, with one being blindfolded and the other being the leader. The leader will guide his or her blindfolded partner through a natural area, being careful to point out fallen trees, rocks, water, and any other obstacles. It is at the leader's discretion to share an interesting path and to guide the blindfolded partner to touch or smell interesting objects, and to listen to different things along the way. Switch roles.
    - Lead blindfolded kids one behind the other with hands on each other's shoulders (Caterpillar Walk). Prompt them to listen to, smell, and feel their surroundings to the best of their abilities. Make frequent stops along the way at places of interest, such as unusual trees or rocks or fragrant flowers or bushes (the more variety along the route, the better). Try on and off the trail, sunny and dark patches, perhaps a riverbed, dry or otherwise if dressed appropriately. At the end of their walk, students can be asked to draw the path they think they followed and then try to retrace their steps using all the context clues they found along the way (e.g., ducks quacking, leaves crackling under their feet, hot sun, cool shade, windy corridors). *Adapted from Joseph Cornell's* Sharing Nature With Children
- **Silent Walk:** A variation on Sitting in Silence (see Activity 78 above). Kids walk silently, then share how many different sounds, colors, insects, etc. they noticed.
- **Village Walk:** Planning an interpretive route around your village can illustrate a range of environmental practices (gardens, tree planting, recycling, and wildlife micro-habitats; also pollution, soil erosion, litter, and solid waste disposal practices).

81. Unnatural Nature

Objectives: To develop observational skills, to increase awareness of natural phenomena

Ages: Young

Materials: Items found in nature; glue, tape, string, or pins for attaching items in different places

Time: 20–30 minutes

Procedure:

In a small area, "doctor up" a number of plants—e.g., fasten leaves, flowers, or fruit of one kind of tree onto the branches of another, or a flower onto a different stem. Try to hide the means of attachment, which would give away the trick. Ask pairs of kids to go out to discover these oddities. The team with the most observations within a certain time limit wins.

Service Learning Activities

Service Learning Activities

In Thailand, Peace Corps Volunteers worked with kids and other community members to construct playgrounds using recycled materials, such as tires and safety belts, from cars. Besides the building and engineering skills needed to create a playground, the kids learned about solid waste recycling. In Cambodia, Volunteers and kids planted 850 tree saplings on Earth Day, learning about reforestation and soil erosion prevention in the process. In Mexico, Volunteers and kids organized community litter cleanups along rivers and coasts.

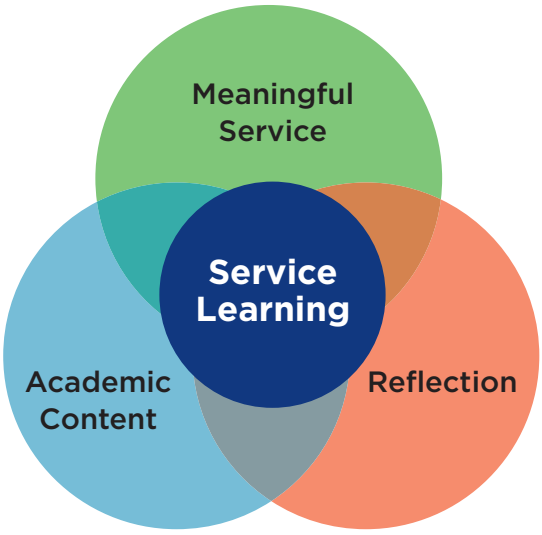
These are just a few examples of environmental service learning projects that Peace Corps Volunteers have carried out over the years. Such projects benefit the community and also help kids become committed, confident, and capable agents of positive change.

Through such service learning projects, kids:

- meet a recognized community need, often educating adults in the process;
- achieve learning objectives through service;
- develop responsibility, confidence, values, and a sense of self-worth;
- develop problem-solving, decision-making, and critical thinking skills;
- acquire useful knowledge about the environment and how to bring about constructive change in civil society;
- gain a lifelong desire and commitment to serve; and
- reflect on their achievements.

One way to visualize the service learning model is by using this diagram:

Service Learning Model



Learning objectives (such as learning about soil erosion), meaningful service (such as planting saplings), and reflection (such as guided discussions) all combine to create a valuable service learning opportunity.

Tips for Pulling Off Service Learning Projects

A Peace Corps resource for how to pull off successful service learning projects is the *V2 Volunteerism Action Guide* (No. CD062). Following are some key points from the guide to keep in mind:

1. Prepare for Service.

Know your kids' sources of inspiration, passions, and interest. Find out how service already takes place in the community. Get a sense of your kids' individual talents, skills, and strengths. Begin to identify what your kids would like to strengthen, improve, or change in their community.

(For example, the kids might be concerned because the school building and grounds are littered with trash.)

2. Identify What We Know.

Select a priority issue to address. Assess what your kids know about the issue. Begin to analyze the causes of the issue. Begin to identify some of the current community resources already addressing the issue. Begin to identify how the kids might help address the issue.

(In this example, you and your kids might discuss where the trash comes from and better ways to dispose of waste, such as collection in trash cans and recycling and reuse bins.)

3. Find Out More.

Develop a broad understanding of the many components of the issue, the causes, and some possible solutions. Identify strategies to learn more from current community resources. Identify what areas require further investigation, and do so. Synthesize the information to identify the best opportunities for action and how the kids can help address the issue.

(Perhaps your kids will want to talk to their teachers and school principal, community leaders, and parents about how they think the trash problem should be managed.)

4. Plan for Action.

Identify the components of a better future in which change has occurred. Establish the goals for the service activity. Outline the strategies and steps for how you are going to accomplish your goals. Identify how you will know you have been successful. Establish both group learning goals and personal growth goals.

5. Mobilize Your Community.

Identify the current and new potential partners for the service activity. Plan ways in which you are going to reach out to the various partners. Consider establishing a mobilization campaign to get new volunteers and resources involved.

(Business owners may have large containers that can be used as recycling, reuse, and trash receptacles. Some teachers or other community members may be able to help by

regularly transporting collected waste to the landfill or to a recycling center. The entire school may be able to take part in a trash cleanup morning.)

6. Implement the Service Activity.

Identify the tasks and responsibilities for each kid in order to carry out the project successfully. Take into account planning and management challenges that may affect the success of the project, and make plans to address them. Identify any additional resources or help you need. Arrange for any instruction or training. Plan how you and the kids will reflect on the effort and how you will recognize those who have assisted.

(For instance, your kids could decide that they are going to set up waste receptacles at key places throughout the school. They could paint receptacles to make them attractive and label them for trash, reusables, and recycling. They could organize a trash cleanup morning with the entire school participating. Kids could convince adults in the community to regularly take the trash to the landfill and the recycling center, and the kids can help organize and promote these trash transportation days.)

7. Assess and Reflect.

Review the entire project—from planning to implementation—and assess how it went. Learn how the project was seen by the community. Reflect, individually and with the kids, on what you have learned. Begin a list of other potential service projects!

8. Celebrate and Demonstrate.

Demonstrate the success of the project to the community. Thank everyone who provided support and assistance.

9. Wrap Up and Follow Up.

Decide whether you want to take on another project and, if so, what it might be. Gather input from those involved to evaluate the project. Document the project, ideally in a written form.

(Meet with your kids after the school cleanup plan has been launched. Carry out a discussion, or try writing and sharing short essays or making posters to display. Make sure kids have the opportunity to express how they feel about what they have done. Are they committed to maintaining a trash-free school? Has this project given them ideas for other issues they'd like to tackle?)

Service learning, as you can see, fits in very well with the core values and practices of the Peace Corps, and doesn't need to be intimidating. It can be as simple as a one-day activity or as long-term as a many-month project. You have an infinite array of possible service projects from which to choose!

The *V2 Volunteerism Action Guide* lists the components of a high-quality service learning project:

- The activities are developmentally appropriate, are relevant to the participants, and lead to attainable and visible outcomes valued by those served. They also "encourage participants to understand their service experiences in the context of the underlying societal issues being addressed."

- The activities have clearly defined learning goals.
- The activities incorporate opportunities for personal reflection that deepens the participants' understanding, increases their knowledge and skills, and refines their values.
- The activities promote understanding of diversity and mutual respect among all participants.
- The activities provide youth "with a strong voice in planning, implementing, and evaluating service learning experiences, with guidance from adults." They "promote development of skills that enhance youth leadership."

Some examples of activities carried out by Peace Corps Volunteers are listed below. Since the most challenging part of service learning activities is often identifying and coalescing around community needs, this chapter also offers some examples of how to launch service learning activities.

Related Resource

V2 Volunteerism Action Guide: Multiplying the Power of Service (Peace Corps Publication No. CD062)

Planning Service Learning Activities

82. Community Mapping

Contributed by Peace Corps/Mexico

Objective: To examine community assets and needs

Ages: Middle, older

Materials: Poster paper, markers and crayons, pencils and paper for taking notes

Time: 1 hour

Procedure:

While taking a walking tour of the community, ask your kids to identify key community institutions, businesses, people, places of worship, and other places of significance. Have kids bring paper and pencils to record their observations about what they see, what they learn, what they like, and what they don't like.

Instruct the kids to form small groups and draw a map of their community on large poster paper. Suggest that they start with their homes and with public places like schools, places of worship, libraries, parks, and other locations where residents gather. Kids should also include notable natural features, prominent species of animals, and common species of plants. Ask questions regarding their choices and emphases. What places are over- or under-represented, and what might this say about the kids' feelings toward and perceptions of their community?

After the kids complete their maps, discuss community assets and needs. Community assets are the positive features the community has to offer: Parks, police stations, and hospitals are assets, as are active citizens in the community and the different cultures of residents.

Broadly speaking, community needs are what the community lacks and the problems it faces: Environmental examples can include litter, lack of shade, limited green space, soil erosion, water pollution, unsanitary management of solid waste, mosquito breeding sites, and unkempt buildings. Ask the group what additional assets or needs they did not observe on their walk but would still add. List their thoughts. From their community maps and community assets-and-needs list, identify common themes among kids' observations. Take time to discuss these themes in depth. Priority areas should be considered as possibilities for service learning projects.

Related Resource

"Community Mapping" in *Participatory Analysis for Community Action (PACA) Idea Book* (Peace Corps Publication No. M0086, p. 31)

83. Community Surveys

Objectives: To learn how the local environment has changed, predict how it will continue to change, and determine how to ensure a bright future

Ages: Middle, older

Materials: Writing materials to conduct interviews, poster paper or chalkboard for wrap-up

Time: Two 45-minute sessions: one for planning the activity and one for sharing what was learned and drawing group conclusions

Procedure:

Young people are at a disadvantage when trying to know how healthy their environment is, because they haven't been around long enough to observe how conditions used to be and how they have changed. They don't know, in other words, what might be possible if people change their environmental behavior. To them, what is "normal" is what they see today. Interviewing elderly people in the community can give kids a historical perspective that can offer them new understanding of what has happened to their community and, therefore, new insights on what might merit their attention in bringing about change. Ideal interviewees are long-term community residents and individuals whom the kids trust and who trust the kids (grandparents, parents, friendly neighbors, teachers, etc.).

When the kids are gathered, hand out paper and writing utensils for each kid, and a list of questions you would like them to ask for their interviews. When the group meets again, everyone can orally present the most important parts of their interviews. The kids can then discuss some of the environmental changes that have occurred. What has changed for the better? What has changed for the worse? Knowing how conditions used to be, what would they like to see happen to the community? From there, the kids can think about whether they can help bring about the changes they would like to see, and how.

Note: It is essential that you make sure that conducting community surveys is culturally and socially appropriate. In some situations, people will regard anyone asking personal questions with suspicion and even hostility. The interviewers—even kids—may be suspected of being agents representing a range of suspicious people, from foreign intelligence operatives to even sorcerers!

Some sample questions from Peace Corps posts are below.

Environment Through the Eyes of the Elders

Contributed by Peace Corps/Armenia and Peace Corps/Costa Rica

1. What kind of work used to be done in the town?
2. How did this work affect the environment?
3. Was there much traffic? Were there more vehicles then, or are there more now?
4. How has the weather changed? Hotter or cooler? More or less rain?
5. How did people heat their houses then?
6. Were there more people then, or are there more now?
7. Were there more trees then, or are there more now?
8. Were there more animals then, or are there more now (both farm and wild)?
9. How was garbage disposed of then?
10. Did they use pesticide/fertilizer then?
11. Were there more fish in the rivers/lakes then, or are there more now?

Family Surveys

Contributed by Peace Corps/Paraguay

1. In what year were you born?
2. How has the community changed since your birth?
3. What were the existing animals and plants in the forest when you were a child?
4. What are the existing animals and plants in the forest now? How many species are gone?
5. Was/were there more forest(s) before? What happened?
6. Did you have a farm during your childhood? If so, how is agriculture different now?
7. What things could you harvest in the forest when you were young?
8. Is it more difficult now to find medicinal plants?
9. How are the opportunities in my generation different from yours?

84. Making a Video or PowerPoint of the Community

Contributed by Peace Corps/Costa Rica

Objective: To develop a presentation that provides an overview of key environmental issues in your community

Ages: Middle, older

Materials: Video recorders (for example, in phones) or PowerPoint software. Alternatives such as poster paper or a chalkboard can also be used. Paper and pencils.

Time: Varies: one to three 1-hour sessions

Procedure:

This project is a good starting point for deciding upon future service learning activities. Have your kids plan and put together a presentation about the environment and their community. The presentation can follow this format:

- An introduction to the community
- The condition of water in the community
- The condition of soil in the community
- Biodiversity in the community
- Effects/impacts/contributions to climate change
- Conclusion

YouTube offers a free online video editor. Simply type in a search for "YouTube video editor" to access this application.

Additional Activities:

Kids can also produce a radio program, make a video into a DVD, use a GPS community map, or build a community or club webpage.

Ideas for Service Learning Projects

Creating Reduce, Reuse, and Recycle Stations

Contributed by Peace Corps/Mexico and Peace Corps/Paraguay

Kids design a plan of action to install needed recycling bins with labels in their school, as well as to promote the practice of recycling among their peers. The kids may initiate conversations with school faculty about recycling; create announcements, signs, fliers, and other promotional tools encouraging everybody to recycle; and install recycling receptacles in the schools and community. Continued participation in this project can ensure that proper recycling practices are sustained. The kids can become actively involved in collecting the recyclables, gathering data on how many recyclables are saved from the trash, and even taking recyclable items to a nearby recycling or collection center.

Beautification Projects

- **Community Beautification**

  Contributed by Peace Corps/Cameroon and Peace Corps/Mexico

  Beautification opportunities abound in community parks, plazas, schools, and public buildings, and on the side of roads. From planting trees to constructing flower beds, clearing brush to picking up trash, painting a mural to repainting trash cans, a dedicated and organized group of kids has a lot to offer the community. Sustain the project by "adopting" that area. Providing regular upkeep and maintenance will embed a sense of pride and ownership in students about the area.

- **Clean-Up-the-Town Day**

  Contributed by Peace Corps/Cameroon

  During these events, all are expected to work on cleaning up their households, villages, and public spaces. Students pick up trash at their schools, families help each other to build and repair latrines, businesses take the time to properly dispose of waste, restaurants bring their hygiene "up to code," households burn their trash, etc. You also can create committees to take care of the public spaces and create reward systems for motivation (e.g., Hygienic Household of the Month, Beautiful Business Award).

- **Adopt-a-Park**

  Contributed by Peace Corps/Mexico

  Kids adopt a local open space, which could be a town plaza, woodlot, or even a national park adjacent to the community. They can undertake a range of activities to improve its condition and make visits to it a more pleasant experience. These can include tree-planting, litter cleanups, designing and constructing nature trails, making signs, making identification labels for trees and other plants, compiling a bird list, and making exhibits for visitor centers.

Courtesy of PC/Mexico

Gardens: Community, School, Home, Medicinal Plants, Etc.

Compiled from contributions by Peace Corps/Cameroon, Peace Corps/Nicaragua, and Peace Corps/Mexico

Kids can interview neighbors about their gardening knowledge, practices, cultivated species, experiences, and advice, then determine the location for the garden, the plant species to cultivate, the tools and equipment needed, the source of water, the proper protection for the plants, and other gardening methods. They should assess the soil and regularly add compost. A weekly schedule of work, maintenance, and watering divided among members can sustain enthusiasm and commitment. Gardening projects are excellent vehicles for teaching kids about the nutritional importance of the vegetables from the garden. With community and school gardens, the kids can harvest as a group and celebrate the bounty with a big meal or a community event that can encourage others to start their own gardens.

Related Resources

Teaching in the Whole Garden (Peace Corps Publication No. R0085)

Intensive Vegetable Gardening for Profit and Self-Sufficiency (Peace Corps Publication No. R0025)

Establishing a Tree Seed Bank

Contributed by Peace Corps/Togo

Establishing a tree seed bank can be the first step toward starting a community tree nursery. With the kids, identify the species of trees you want to propagate and determine the seasons when they produce seeds. Now, take your group of kids out to find the tree species you are looking for, along with the tools necessary for harvesting tree seeds (e.g., ladders to reach the seeds, buckets to collect them). Look for trees that are healthy, as they are most likely to have healthy seeds. You or other adults should probably be the ones who climb the ladders or trees to harvest the seeds. Beforehand, however, do your best to ascertain whether they are harboring any nests of stinging insects, such as bees, wasps, or aggressive ants, and whether there might be any hazards associated with rotting, unstable branches. Map a route up the tree that you feel is safe, and stick to it. After gathering seeds, dry them, put them in a jar or box, and store them in a dry place. You can also put the seeds in a little ash to protect them against pests.

Let's Grow a Tree Nursery!

Contributed by Peace Corps/Cameroon and Peace Corps/Nicaragua

Kids can work together to establish a nursery (mixing soil, ash, lime, and fertilizer in the seed bags; protecting the nursery site from animals and young kids), then adopt seeds and seedlings of their own (planting the seeds and watering them). Once the seedlings are ready for transplanting, the kids can decide who gets them, possibly distributing them as part of an Arbor Day celebration or some other event.

Related Resources

Peace Corps Tree Planting/Nurseries Training Package

USDA *Tropical Nursery Manual,* 2014, Agriculture Handbook 732

Tree-Planting (Community Woodlots, Fruit Orchards, Agroforestry, Etc.)

Contributed by many Peace Corps posts

Tree-planting is a popular youth service project. Kids have planted tree seedlings in a variety of places: schools, town plazas, community woodlots, and national parks, to name a few. Typically, the seedlings come from nurseries, which either donate the seedlings or sell them to sponsoring organizations, government ministries, and local governments. For the trees to survive until maturity, you need to arrange for either the kids, or someone else, to care for the seedlings: watering them, protecting them from animals, weeding, etc.

Preparing and Displaying Community Water-Use Posters

Contributed by Peace Corps/Nicaragua

Topics can include the consequences of, and solutions to, chemical pollution, gasoline spills, misuse of pesticides, overuse of fertilizers, human waste contamination, blowing litter, and soil erosion.

National and International Observance Days

National and international observance days make great opportunities for kids to organize activities and events that educate members of all ages in their communities, developing their leadership and organizational skills in the process. Activities can include parades, nature and community walks, bird watching, lectures, debates, workshops, environmental games and competitions, contests, exhibits and posters, puppet shows and theater, mask-making, and contacting local media. Below are some observance days that different Peace Corps countries have celebrated:

- World Water Day: March 22 (Peace Corps/Paraguay)
  www.unwater.org/worldwaterday
- International Earth Day: April 22 (Peace Corps/Benin, Peace Corps/Paraguay)
  www.earthday.org
- Arbor Day: The last Friday in April (Peace Corps/Benin, Peace Corps/Paraguay)
  www.arborday.org/
- International Day for Biological Diversity: May 22 (Peace Corps/Paraguay)
  www.cbd.int/idb/
- World Environment Day: June 5 (Peace Corps/Benin)
  www.unep.org/wed/
- World Population Day: July 11 (Peace Corps/Benin)
  www.unfpa.org/events/world-population-day
- World Day of Cleaning (Peace Corps/Benin)
  www.letsdoitworld.org/about
  www.cleanuptheworld.org/en/
- Festival of Birds (Peace Corps/Paraguay)
  www.presqueisleaudubon.org/festival.html
  http://friendsofpointpelee.com/festivalofbirds

Courtesy of PC/Zambia

Soil and Water Activities

Soil and Water Activities

85. Aqua Words Relay Race

Contributed by Peace Corps/Armenia

Objective: To learn why water is important to people and wildlife

Ages: Young, middle

Materials: Paper of different colors, writing utensils, scissors, two bowls

Time: 30 minutes

Procedure:

Begin by asking each kid to write down the name of an object (e.g., shoe, flower, river) on a piece of paper. Collect all the papers and divide the group into two teams for a relay race. Redistribute the papers, giving one to each kid. Mark a starting line and place two containers 20–30 yards away, one marked "water" and one marked "no water." Line the two teams up at the starting line. When you say "go," the first kid from each team runs up and places their paper in the "water" or "no water" container. The "water" container is for objects that use, or are made with, water, either directly or indirectly. The "no water" container is for objects that are not connected somehow with water. Once the kid has deposited the paper where they think it should be, they return to their line to tag the next kid, and so on. The winning team is the team that sorts all their papers first.

Gather the kids to discuss the sorting results. Go through the "water" container first, asking the kids if they agree with every object. Next, go through the "no water" pile and discuss how the objects do, in fact, use water either directly or indirectly. For example, a shoe is connected to water because the leather comes from a cow that drinks water and the shoe is made in a factory that uses water to run and cool its equipment. Do the first two or three and then encourage the kids to make the water connections.

86. Building Model Watersheds

Adapted with permission from IWLA's Creek Freaks Curriculum

Objective: To learn about watersheds, pollution sources, and pollution prevention through building model watersheds

Ages: Young, middle, older

Materials: Flat containers, like baking pans, in which to build watersheds; natural materials, such as soil, rocks, twigs, grass, moss, large seeds, etc., to build watershed models; a container for water to pour onto the finished model (A spray bottle of water that can be set to a "mist" setting is ideal, if available.)

Time: 30–90 minutes

Procedure:

Model watersheds offer a clear visual demonstration of how water picks up sediment and pollutants as it flows and how to prevent pollution from reaching waterways.

Courtesy of IWLA

Divide your kids into teams, give each team a container for their watershed base, and send them outdoors to use natural materials to build their watershed models. Areas of the models can represent fields, pastures, latrines, etc.

Each team can think about the community included in their watershed; its geography, economy, and society; and pollution produced as a result of these factors. Kids also can use the model to showcase a variety of pollution prevention techniques appropriate for their watershed's geographic, economic, and social factors. Have each group present their watershed, its characteristics, pollution problems, and pollution prevention techniques. The kids can then pour water onto their models, either gently with a bowl or other container or with a spray bottle of water. They should apply the water until it starts to collect and run, and observe where the water flows and collects.

Wrap up the activity by discussing watersheds. Some talking points:

- Make sure the kids know what a watershed is. (An area of land that drains water, sediment, and pollutants into a common body of water. For example, in the United States, the Chesapeake Bay watershed is made up of uncountable smaller watersheds, all eventually draining into the bay.) Can they name the watersheds in their community?
- How does pollution at the top of a watershed get spread around? (By flowing water that transports it downhill.) What are some examples of pollutants in the community that are likely being carried off by moving water? (Fertilizer, pesticides, manure, trash and garbage, household chemicals, excess sediment, etc.)

87. Clear Water Is Not Clean Water

Contributed by Peace Corps/Cameroon

Objective: To demonstrate that clear water is not always safe to drink

Ages: Young

Materials: Four plastic water bottles, water, salt, sugar, cinnamon or some other visible spice

Time: 20 minutes:

Procedure:

Bring four water bottles full of water. The bottles should contain clean water, water with salt, water with sugar, and visibly dirty water (could use cinnamon or another spice). Have participants choose which water they would like to drink. Have them take a big gulp. Make

sure they are facing the group so that the group may view their reaction to the taste. Participants can take turns, but make sure to rearrange the water bottles between each taste test in order to preserve the surprise. Shake water bottles as necessary.

Next, ask group members what they have learned from this activity. Which water bottles look clean? Is a clean-looking one always actually pure? How does this translate to our lives? This activity should get people thinking about the water they drink in their own households. Transition into a discussion about the various germs, fecal particles, amoebas, worms, and other illness-causing substances that exist in seemingly clean water.

88. How Much Water Will This Soil Hold?

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objective: To observe how water drains from different types of soils and the impact soil health has on surrounding waters

Ages: Middle, older

Materials: Metal cans emptied and rinsed, can opener, pliers, ruler, permanent marker, large measuring cup, plastic drink bottles, watch or other time-keeping device

Time: 5–10 minutes per soil site

Procedure:

This simple demonstration shows kids that soils compacted by livestock, vehicles, and foot traffic do not absorb water. Instead, rainwater runs off the land, causing water levels in streams to fluctuate dramatically and leaving little for plants during dry periods. In contrast, healthy soils, because they contain a myriad of pores and cavities, absorb water and retain it.

Prior to the demonstration, locate sites in your community where there are different soil types, such as:

- bare, compacted soil;
- a grassy area that doesn't see much foot or livestock traffic;
- a wooded area;
- muddy, wet soil; and
- sandy soil.

To test how quickly water drains from each of these areas, remove the tops and bottoms from metal cans and crimp the rims with pliers to eliminate sharp edges. With a ruler, measure 2 inches from the bottom of the cans, and draw a line inside each can with a permanent marker. Now, at each site, place a can on the ground and twist it back and forth into the soil, ideally about 2 inches down. Fill a plastic drink bottle with water, and pour the water into the can up to the 2-inch line. Time how long it takes for the water to drain (calling out times using your timepiece or asking the kids to call out "One one thousand, two one thousand, etc.). If you reach the five-minute mark or if the kids get restless before the water has drained, you can move on to the next sites and repeat the procedure.

Discussion Questions:

1. Which soils absorbed more quickly? Why do you think that is?
2. Why is it important for soil to be able to absorb water?
3. What activities damage soil quality, and how can we improve soil quality?

89. How Soil Quality Affects Plant Growth

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objectives: To understand that plant growth depends on soil quality, and to learn what makes soil more or less fertile

Ages: Young, middle

Materials: Equal-sized plant pots (with drainage holes) or paper/plastic cups (perhaps made from plastic bottles), small gardening trowels, examples of various soil types from around the neighborhood, bucket or covered plastic container, water; masking tape, permanent marker or some other means of labeling the different pots; measuring cups, fast-growing vegetable seeds (plant only one kind of seed)

Time: Initial soil preparation and seed planting: 20–30 minutes; growth time: several weeks (until plants appear)

Procedure:

In this activity, kids plant seeds in pots with different types of soil and compare their results.

Before the kids plant their seeds, obtain examples of different soil types; for example, sand, silt, clay, loams, compost, fertile topsoil, soil from permagardens, and combinations of them. With clay soil, be sure to break up the clumps until the soil is fairly smooth. Use pots with drainage holes or punch holes in the bottoms of your paper/plastic containers to show how much water may run out of different soil types. Now have the kids fill the containers with the different soils. Plant several seeds in each and water them. To control the factors that can affect plant growth, use the same amount of soil in each container, plant an equal number of seeds in each container, and water each with the same amount of water. (Use a measuring cup if you have one.)

With masking tape and permanent marker if you have them, label the soil combination in each pot. Ask the kids to predict which seeds will grow the best and write down their predictions. Place the pots in a sunny location and continue to water them. After a few weeks, compare the plant growth in each pot, and discuss why plants (hopefully) grew better in certain types of soil. You can transplant the plants that grew well, or the kids can take them home.

90. Keeping Water Safe Demonstration

Contributed by Peace Corps/Cameroon

Objective: To learn how fecal matter can get into water supplies

Ages: Middle, older

Materials: Open container, dipper, drinking cup, edible powder (e.g., corn starch, flour), water

Time: 20 minutes

Procedure:

Set up an area in front of the group with an open container full of water, a damp dipper on the floor next to the container, a drinking cup next to the dipper, and powder in two or three areas on the floor, some near the dipper. Explain that the powder is fecal matter left by animals/children on the floor/ground. Walk on top of the powder and say you are going to the kitchen to fetch some drinking water. Make sure plenty of powder falls off your shoes next to the dipper. Place the dipper in the water, and then pour a small amount into the drinking cup. Put the dipper back down on top of some powder. Drink the water, then put the dipper back into the water and pour some more into the cup. Ask if anyone would like to drink this water. Then ask why or why not. Ask them to describe what they saw and how we might prevent the powder, or fecal matter, from getting into the water.

Do a group container-cleaning session, and talk about the importance of cleaning water containers with soap and a scrubber once a week. Also talk about using clean dippers (with handles), preventing the dippers from touching the ground or other surfaces (attach with string to a wall or table), keeping foreign matter out of the containers, and keeping the containers covered to avoid oral-fecal contamination by flies as well as malaria-carrying mosquitoes attracted to stagnant water.

Variation:

Another way of carrying out this exercise is to spread an amount of powder on the floor where kids are going to walk. When the kids enter the room, they will get the powder on their shoes and feet. Hopefully, they won't notice too much. Now, get them engaged in some activity in which they are sitting or on their hands and knees on the floor, perhaps an art project or a discussion ring. After a while, ask the kids how many of them have powder on their hands, arms, and even faces. Tell them that the powder represents, in fact, fecal matter from animals and small children. What would happen if the kids put their fingers in their mouths or got the powder in their water or on their food? Do they see how fecal matter can spread and cause disease?

91. Let It Rain: How Plants Help Keep River Water Clean

Adapted with permission from IWLA's Creek Freaks Curriculum

Objective: To demonstrate how riparian buffers (trees, shrubs, and native grasses growing along the streamside or riverbank) work, and the importance of restoring them to protect and improve water quality

Ages: Young, middle

Materials: Ropes or cones to mark two sides of a riparian zone

Time: 20–30 minutes

Procedure:

See Figure A. Kids (colored dots on the left) represent pollutants in rainwater runoff. Have each kid say what kind of pollutant he or she is. The area between the two lines represents the riparian zone at the edge of a stream or river. The one volunteer in the middle of the riparian zone below is a community volunteer who is trying to restore the zone. The volunteer has to stay inside the zone.

When the volunteer is ready, he or she calls out, "Let it rain!" The pollutants try to run across the riparian zone without being tagged by the volunteer and cross the line on the opposite side of the zone, where they are then "safe." See Figure B.

Figure A

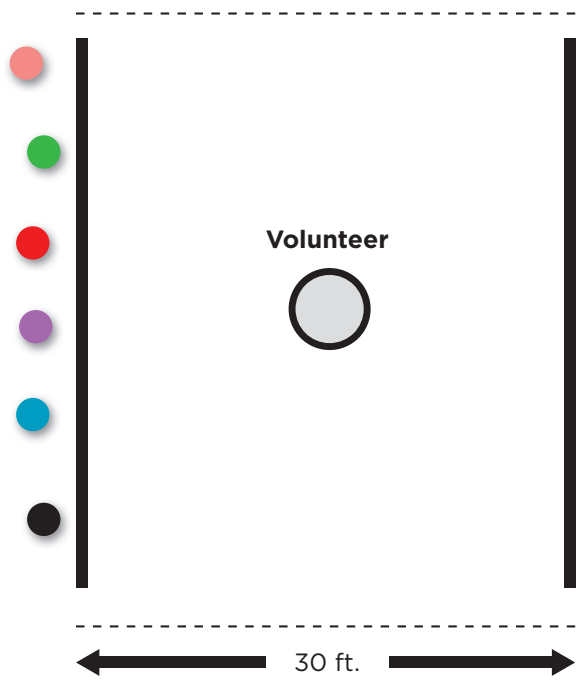
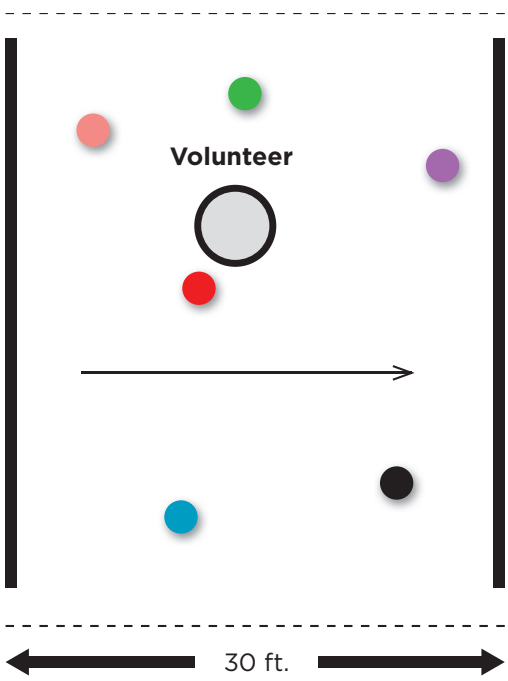


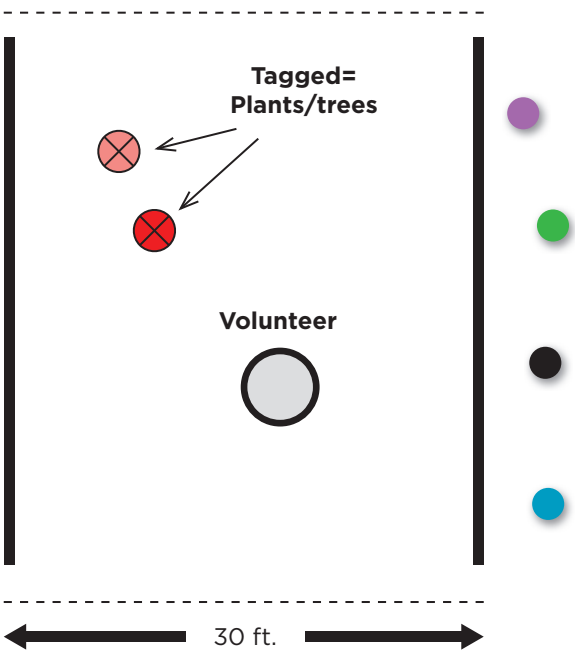
Figure B



All figures courtesy of IWLA

As the volunteer tags running "pollutants" that are being washed by the rain, he or she converts them into plants, and they have to stand still. After one round of "rain," the game area will look similar to Figure C.

Figure C



The volunteer then calls out again, "Let it rain!" and the pollutants try to run back across the riparian buffer zone without being caught. Although the plants cannot move, they can tag pollutants that run within their reach and turn them into other plants. The game continues with the volunteer calling out rounds of "Let it rain!" until all the pollutants have been converted into plants.

Discuss with the kids the importance of plants in a riparian zone to control rainwater runoff. Let the volunteer describe how it became progressively easier to prevent runoff pollutants as more plants were established in the buffer zone. Why is riparian zone protection and restoration important?

92. Neighborhood Soil Walk

Objective: To learn how to recognize eroded and degraded soil, and that healthy soils produce more plant growth

Ages: Middle, older

Materials: None

Time: Dependent on walking distance between sites

Procedure:

This is a guided neighborhood walk during which kids compare healthy and degraded soils. Prior to your walk, locate at least two sites in your community, one with healthy soils such as could be found in a woodlot or a healthy garden, and one where the soil is eroded and degraded. Show the kids the two sites, and ask them to do the following at each:

1. Take a handful of the soil. How do the textures compare? (Fertile soil, with a comparatively higher percentage of organic soil, will typically feel less gritty than eroded soil.)
2. How do the colors compare?
3. How does the moisture compare? (Fertile soils, because they have more porous texture, usually retain moisture more effectively.)
4. Which soils have more little creatures living in them? (Typically, fertile soils)
5. Which soils have more decomposing organic matter? (Typically, fertile soils will have more decomposing leaves and plant material.) Where did the organic matter come from?
6. Which soils are supporting more plant growth?
7. What soil erosion evidence do you see (e.g., exposed roots, rills and gullies, pebbles)?
8. Follow-up discussion question: Why do people need to fertilize agricultural fields but not natural forests? (With agriculture, people continually remove crops from fields, thereby steadily taking away nutrients from the field ecosystem. Over time, these nutrients become depleted and have to be replaced. In natural forests, trees and plants die and shed leaves. The organic matter stays in the locality and decays, and the nutrients become available again to the plants.)

93. Reducing Soil Erosion

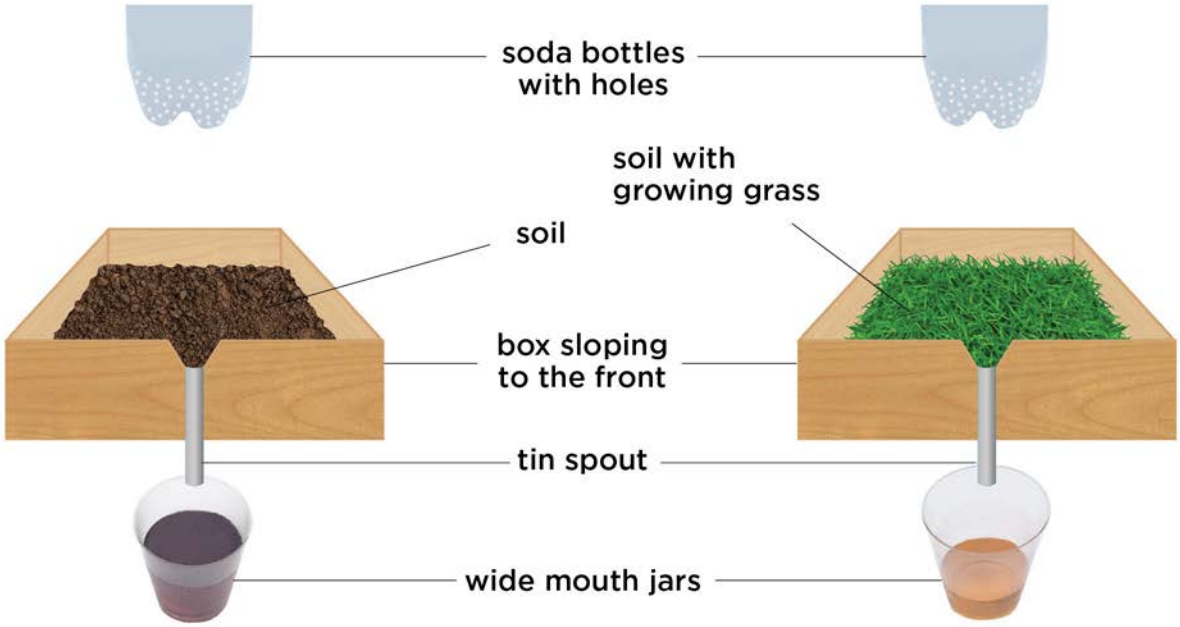
Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objective: To understand how crop cover, mulch, and contour plowing help limit soil erosion

Ages: Middle, older

Materials: Wood to make two shallow, open boxes; plastic to line the boxes to make them waterproof; thin sheets of tin for making spouts for the boxes; dirt and sod or mulch; two 2-liter soda bottles; sharp instrument to use to poke holes in the bottles; two large, wide-mouth glass or clear plastic jars

Time: 30 minutes, after constructing the boxes

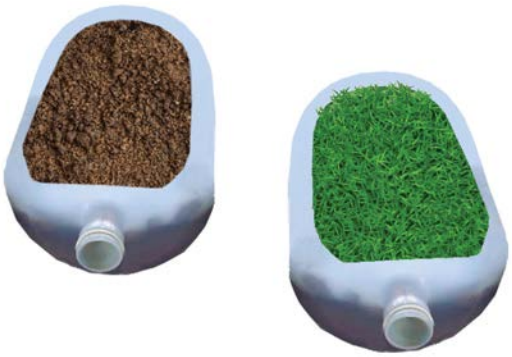


Procedure:

First, construct two open boxes as least 16 inches long, 12 inches wide, and 4 inches deep. Line each box with plastic to make it waterproof. Cut a notch in one end of each box 1 to 1 ½ inches from the top edge and fit each with a tin spout to direct water into the wide-mouth jars. Poke holes in the bottom of the soda bottles, which will serve as sprinklers.

To demonstrate how mulch and crop cover retard soil erosion, fill one box with bare soil. In the other box, put either grassy sod or soil covered with mulch. Place the two boxes on a table, with the spouts hanging over the edge of the table, and tilt them with sticks, books, or other objects so the non-spout ends are 1–2 inches off the table. Beneath the two spouts, place or have someone hold the wide-mouth jars.

Now, fill the soda bottles with water and pour the water onto the two boxes at the same time, simulating the effect of a rainstorm. Observe the water that runs out of the tin spouts and into the jars. Which jar of water seems to be clearer? Which water seems to have more soil in it?



To demonstrate how contour plowing controls erosion, fill both boxes with soil from the same source. Using a pencil, a stick, or your finger, make several grooves in the soil in one box going lengthwise, and grooves going across the width of the other box. Fill the soda bottles with water and pour water on the boxes at the same time. Observe the water that has collected in each jar. Which jar of water seems to be clearer? Which water seems to have more soil in it?

Variation:

Instead of boxes, you can use the halves, cut length-wise, of 2-liter soda bottles.

94. The Scoop on Soil: Soil Texture Test

Adapted with permission from IWLA's Creek Freaks Curriculum

Objectives: To describe local soil characteristics, and to determine whether local soil is more similar to sand or to clay soils

Ages: Middle, older

Materials: Enough soil samples from as many different places around their homes as possible (e.g., garden, field, forest, stream bed, lake shore); samples of pure sand and pure clay, so that each kid has approximately 1 tablespoon of each type (The sand and clay might be purchased—modeling clay or clay to throw pottery is recommended—while the local soils can be collected from around the community.); a water bottle to slowly drip water into the kids' hands; copies of the "Texture Test Chart" for each kid; pencils; trowels; paper or plastic bags for collecting soil

Time: 90 minutes

Procedure:

Have kids collect soil samples from two different areas in the community. These samples may be from different fields for crops, from wooded land, from a streamside, or from pastures. Return to your workplace with the soils and hand out the "Texture Test Chart" below and a pencil to each kid. Starting with sand, spoon out about a tablespoon of sand into each kid's hands and sprinkle the sand with water. Have kids go through questions 1–7. Repeat the steps for all four different soil samples. Go over the answers to the "Texture Test Chart." Ask the kids which community soil is more like sand? Which community soil is more like clay? Explain to the kids that even though all of the soils are different, they are all composed of the same components: mineral and organic matter, water, and air.

Texture Test Chart

	Sand	Clay	Local Soil (1)	Local Soil (2)
1. Can you form a ball?				
2. Can you form a ball and then roll the ball into a snake?				
3. Can you form a ring with the snake shape you made?				
4. Does your sample feel gritty or sandy?				
5. Does your sample feel smooth, like flour?				
6. Does the sample feel neither gritty nor smooth?				
7. What color is the soil?				

95. Waterlogged Watershed Walk

Objective: To demonstrate how watersheds work

Ages: Middle, older

Materials: Paper, writing utensils

Time: 30–60 minutes

Procedure:

During, or just after, a rainstorm, take the kids on a walk on the school grounds or elsewhere in the neighborhood to trace where water flows. Find a rivulet and follow its course downhill as long as you can. Once you have done this, distribute paper and writing utensils to the kids, and ask them to map the route the water followed, drawing relevant neighborhood landmarks, such as buildings and streets.

After the kids have finished, make sure they understand that they have seen what a watershed is and have mapped a portion of one.

Discussion Questions:

1. How clean is the environment the water was flowing through? Did the water flow through trash, manure, or bare soil? Is the water picking up and carrying off any substances that are polluting it?
2. Where does the water we traced ultimately end up? Does it end up in the water supply of the community or of other communities downstream? Do you think it's a good thing that the water we followed is ending up in people's water supply?
3. Did you notice water collecting in puddles and ditches? Could mosquitoes be breeding in this standing water? Do you notice plastic garbage clogging ditches, etc., so water can't escape, thereby backing up and creating more potential mosquito breeding sites?
4. In urban areas where runoff disappears down storm drains, what happens to the water? (Perhaps you can obtain a map of the drainage system from the water department.) What pollutants is the runoff picking up (e.g., oil, animal droppings, litter)?
5. Do you have any ideas about improving the environment through which the water flowed? (Remove trash, plant trees, build soil erosion control structures, or remove potential mosquito breeding sites, etc.)

96. Watershed Hands

Adapted with permission from IWLA's Creek Freaks Curriculum

Objective: To understand and demonstrate the features of a watershed using hands.

Ages: Young, middle

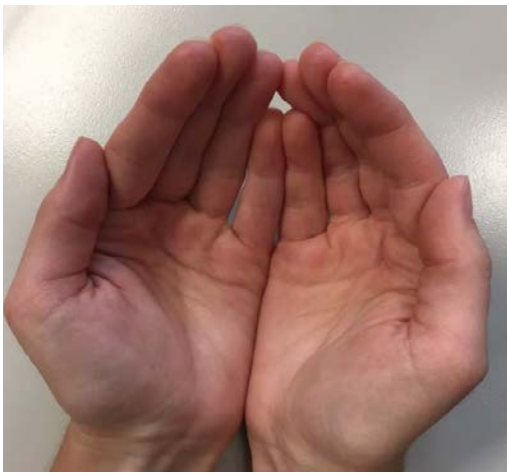
Materials: Your hands, water (optional)

Time: 5–10 minutes

Procedure:

A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place.

1. Cup your hands as shown in the photo, and instruct kids to do the same.
2. Ask kids: "If a drop of rain fell on my fingertips, where would it go?" The kids should answer, "Down" or "To your palms."
3. Explain that your hands are demonstrating a watershed, or an area of land that drains water.
4. Relate different features to types of water bodies:
    - The tips of your fingers are like mountains.
    - The cracks between your fingers are like small streams.
    - Between your two hands is a larger river.
    - Your palms are a large body of water—usually an ocean, but if there is a large, important body of water near you, you can relate it to that.
5. You may also mention that any water that drips between the cracks in your fingers can represent infiltration, which recharges groundwater supplies.



Courtesy of IWLA

Variation:

For an active learning session, you may drip or spray water on kids' hands and have them observe the water flow.

Additional Activity:

To explain watershed divides, place your hand in a fist. Explain that your knuckles represent mountains, or a watershed divide. Rain that falls on one side of your hand will run down to one watershed, and rain that falls on the other side will run down to another watershed. You may likewise spray kids' hands with water to reinforce the concept.

Courtesy of IWLA

97. Where Is Our Water?

Compiled from contributions by Peace Corps/Paraguay, Peace Corps/Nicaragua, and Peace Corps/Dominican Republic

Objective: To identify sources of water available for human use

Ages: Young, middle

Materials: Containers of various sizes, including two 2-liter soda bottles; measuring cup, preferably one that includes milliliters; eyedropper; labels; marker

Time: 20 minutes

Procedure:

This activity works best if you can locate an eyedropper and a measuring cup or other container that indicates milliliters.

Collect one or two 2-liter soda bottles and containers of various sizes, and fill the two soda bottles with water. Inform the assembled kids that one of the bottles represents all of the saltwater and freshwater in the world. Now slowly and carefully begin to pour the water into a container with milliliters marked on the sides. Ask the kids to tell you to stop once you have poured the amount that accurately reflects the proportion of the planet's water that is fresh. (See below; the answer is roughly 60 milliliters.) When a kid calls out "stop," write down who that is and the amount of water in the open container. Continue pouring until all the kids have called out a guess of the correct amount. Now reveal to them the kid whose answer came the closest. That kid is the winner. Pour the excess water in the container back into the 2-liter soda bottle until you have roughly 50–60 milliliters in the other container. This will enable the kids to see the ratio of saltwater and freshwater in the world.

- All the water in the world: one full two-liter bottle
- Oceans and other saline water (groundwater and inland seas): 1,940 milliliters
- All the freshwater in the world: 60 milliliters

Next, tell the kids that the water in one of the 2-liter bottles represents all the freshwater in the world.

Prior to this, write labels as follows: "Ice caps, glaciers, and permanent ice"; "Groundwater"; "Soil moisture"; "Freshwater lakes"; "Atmosphere"; and "Rivers." Turn the labels over so the kids cannot read them. Number each container. Parcel out the water into the other containers as follows (Use a measuring cup if available; otherwise, estimate amounts as closely as you can.):

- All the freshwater in the world: one full 2-liter bottle
- Ice caps, glaciers, permanent ice: 1,360 milliliters
- Groundwater: 600 milliliters
- Freshwater lakes: 5 milliliters
- Soil moisture: I milliliter
- Atmosphere: 1 milliliter
- Rivers: 1/10 milliliter (one drop)

Source: **water.usgs.gov/edu/earthhowmuch.html**

Arrange the containers on a table with the labels hidden, and write the categories on a flip chart paper or chalkboard. Ask the kids to compare the amount of water in each and vote on which bottle matches each description. Mark how many votes each number gets. For example, "Groundwater" may have six votes for bottle #2, three votes for bottle #4, and one vote for bottle #6. Once the kids have finished voting, turn the labels over one by one. Ask the kids to tally up how many correct answers they had. (You can ask them to write down their answers on scraps of paper, or you can go by the honor system.)

Discussion Questions:

1. How much water is available to us for drinking and agriculture?
2. From which places (rainwater, surface water, groundwater, deep groundwater, some glacial water)?
3. Why do you think it's important to keep this water clean, to use it wisely, and not to waste it?

General Guidelines on Composting

The next four activities in this chapter focus on composting. These general composting guidelines, therefore, might come in handy:

1. Compost heaps are composed of "brown" and "green" layers, with recommended ratios ranging from equal to 15:1. The layers should be covered with a thin layer of good soil or mature compost, which serves to inoculate the new compost mix with essential bacteria and fungi that will speed up decomposition.
2. Green layers are made up of things like grass clippings, vegetable waste, fruit scraps, and coffee grounds. As they decompose, green layers provide nitrogen to the developing compost.
3. Brown layers include materials such as dead leaves, shredded branches and twigs, and paper scraps. These brown materials provide carbon for your compost.
4. You should not add meat and dairy products to your compost.
5. Locate your compost in a dry, shady spot. Moisten layers with water as you add them to the heap. It's important to mix the compost every two to three weeks so that it is well oxygenated. Add water, if needed, to keep the materials damp.
6. Take precautions so that animals do not invade your compost. (If the compost is cooking properly, though, this shouldn't be a problem.) You may want to use a bin, or you may choose to cover your compost with a tarp and keep it in an enclosure.
7. The time to compost varies widely depending on compost ingredients and the outside environment. A compost heap can take anywhere from two to six months to transform into what is called "humus"—a rich, nutrient-filled material that can be used in agriculture and gardening.

The U.S. Department of Agriculture has posted additional information on composting at this link: **http://afsic.nal.usda.gov/soil-and-water-management/compost-and-composting**

98. Composting and Decomposition

Contributed by Peace Corps/Armenia and Peace Corps/Mexico

Objective: To see what composting can do with organic waste

Ages: Young, middle, older

Materials: Large plastic bag, soil, materials to decompose, index card or paper, tape, screen or netting if available, white poster board or butcher paper desirable

Time: Two sessions within a month of each other (90 minutes total)

Procedure:

This activity shows kids how organic wastes dramatically transform themselves into valuable compost.

Begin by telling the group that you have the ingredients for a recipe. Ask them if you always know what the results will be when you mix ingredients together, and to share any examples they know of to support their thoughts. Now, ask the kids to guess what will happen when you mix the compostable materials together.

Take the large plastic bag and put a gallon of damp soil in it. Add the materials you want to compost (food scraps, paper, wood chips, grass, leaves, etc.). Mix all the ingredients well into the wet soil so they are distributed throughout the bag. Blow the bag up with air and then close it tightly. Record on a card what was put in the bag and the date it was sealed up; tape it to the bag. Hang a sign on the bag that says: "What's going on in here?" Put the bag out of the way. Ask the kids what they think will happen, and write down their responses (or ask them to write down their predictions in journals or draw what they think the contents will look like in a month).

After a month, ask the kids to read the list of materials that were put in the bag. Ingredient by ingredient, ask them to hypothesize what happened to each. Now, open the compost bag outside and pass the contents through a screen or netting, if available. Sprinkling the contents on white poster board or butcher paper will enable the kids to see them more clearly. Have the kids observe the condition of the ingredients, refer back to their original predictions, and draw conclusions. What changes occurred?

To follow up, discuss decomposition, decay, and nutrient recycling. Introduce composting as a way to put nutrients back into the soil using natural decomposition. Explain that composting takes nature's process of recycling nutrients and accelerates it. A well-made compost heap creates an environment in which bacteria, fungi, and other organisms can live, feasting on the organic matter and converting fresh manure, food scraps, leaves, seeds, wood ashes, sawdust, and other compostable materials into dark humus. All healthy compost piles need an equal mass of nitrogen-rich materials, such as food scraps and manure, and carbon-rich materials, such as dry grass, wood chips, and paper products, as well as air and water to keep the aerobic bacteria happy.

Finally, hold up two different fruits. Ask, "How could one fruit become the other and become you?" (Fruit A is dropped under the Fruit B tree, where it decomposes and adds nutrients to the soil. The roots of the Fruit B tree absorb the nutrients, some of which go into the fruit of the tree. You come along and eat Fruit B.) How could the apple core become part of you?

You can also do this decomposing activity with plastic to show that it decomposes very slowly. This can lead into a discussion of waste pollution.

99. Composting and the Decomposer Chart

Contributed by Peace Corps/Armenia

Objective: To learn why composting is important and how to do it

Ages: Middle, older

Materials: 2-liter plastic bottles cut in half (use bottom half), soil, garbage, chart, writing utensil, marker, masking tape, plastic wrap to cover the plastic bottles, rubber bands

Time: 45 minutes to begin, and then 5–10 minutes weekly for observations

Procedure:

This activity illustrates the different rates at which various substances decompose. The activity can lead to discussions about composting and solid waste disposal.

Ask the kids to bring in a variety of different garbage items (food scraps, paper, plastic, wrappers, leaves, feathers, etc.). Fill each of the cut plastic bottles with 10 cm of soil, and set it on your windowsill. Put one or two pieces of trash in each bottle (depending on the size of the trash), on top of the soil. Add a little more soil on top, and moisten with water. With a marker, write on each bottle, perhaps on a piece of masking tape, the trash item it contains. Cover each bottle with plastic wrap held with a rubber band, and wait.

Over the next several weeks/months, have the kids note what happens to the trash, keeping a record in a chart, such as the one below (Idea for a Journal). During every meeting, ask a kid to remove the cover to let each bottle get some air and to observe how each item has changed. Continue to add water and let the sun shine into your bottles. Otherwise, keep the lid closed for warmth and humidity. Make sure to ask the students for their responses to the changes.

You can do this project for four weeks or longer. At the end of a month, imagine how long it will take plastic bottles and glass containers to disappear. Some items will remain longer than we do. Some items will disintegrate within a month.

Note: If composting is occurring, this activity should not smell.

Idea for a Journal

Name of item: _____ Date: _____

First noticeable change: _____

When can you not recognize it? _____

When does it disappear? _____

Is it food or garbage? _____

To follow up:

- Discuss what will happen when we put plastic in the ground. What problems can this cause? What can we do to help solve this problem?
- Discuss why composting is a preferable alternative to throwing trash away or burning it.
- Have the kids share their results with parents and try composting at home.
- Discuss what happens with leaves when they fall to the ground. Why don't they pile up?

Variation:

Contributed by Peace Corps/Mexico

Rather than putting different compostable materials into different bottles, you can combine them into one container. For the first layer, use the lid to scoop about an inch of soil into the empty bottle. Then add sequentially 1-inch layers of different organic matter with soil in between them. Add a little water after each layer as well. Seal the bottle with a piece of plastic and a rubber band. Ask students for predictions of what will happen and what layer will decompose fastest/slowest. In subsequent meetings, open the containers to let air in and add fresh water. Check the bottles in a month; discuss what happened to the different materials.

100. The Tiny Beastie's Feast: How Composting Affects Plant Growth

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objectives: To identify the factors in the decomposition of organic matter; to describe how to make compost and how it enriches soil, enabling plants to grow better

Ages: Middle, older

Materials: Containers for compost samples (e.g., buckets, trash receptacles), soil (amount depending on the size and number of containers), small bags or other small receptacles in which kids can put food scraps from home and bring them to the session, knife to chop organic items; abundance of organic waste matter provided by kids, school, outdoors, etc.; lime (not a necessity but may help eliminate pungent odors), fertilizer, red worms, watering container, thermometer, paper, writing utensils

Time: Initial setup, 45–60 minutes; several months for results to appear

Procedure:

In this activity, kids alter different compost characteristics and compare the results. In each container, the kids will test different soil/compost combinations; for example:

The control: one container with soil and organic waste without fertilizer or manure that is watered periodically

- One with fertilizer or manure added
- One container that is not watered periodically
- One container with worms used in vermiculture
- After several months, check to see if any of the samples have become compost. Which sample has become compost first?

Once you have compost, mix it with soil in one container, and fill the other container with the same soil minus the compost. Plant three or four seeds in each, set aside in a sunny place, and water periodically.

Discussion Questions:

1. Which plants germinated first?
2. Which plants grew more quickly?
3. What does this tell you about the value of composting for gardeners?
4. How can composting reduce the amount of garbage we throw away?

Variation:

This experiment illustrates how important organic matter is in creating fertile soil and that decomposers, such as bacteria and fungi, are crucial to the process. In the bottom of your containers, put 1–2 inches of fertile soil. Chop up your materials to make organic and synthetic mulch.

- In three of these containers, put a half-inch layer of organic mulch, making sure that the amount and type of material is the same in all of them. Set one of these containers aside; this is Container #1.
- In Container #2, put more soil on top, a good 2 inches or so.
- In Container #3, put the same amount of soil as Container #2 on top and put it in a refrigerator (if you have one; if not, skip this step).
- In Container #4, put the synthetic mulch and cover with 2 inches or so of soil.
- In Container #5, put only the organic mulch with no soil.

Leave all containers open to let air in. Add some water a couple of times a week, just enough to dampen the samples. Keep all containers out of the sun. After a few weeks, examine the contents, spilling the contents out to examine for signs of mold and fungi (typically, fine white threads on leaves).

1. In which container did the organic matter decay the most quickly? Why?
2. Why does placing soil on top of the leaves speed up the decaying process? (More bacteria and fungi)
3. Why did Container #3 in the refrigerator not decompose as fast? (Cold temperatures retard bacterial growth.)
4. Why didn't the synthetic matter decompose? (Bacteria and fungi don't "eat" these materials.)
5. When recycling synthetic materials, who or what must take the place of bacteria and fungi? (Humans)
6. Is there such a thing as "waste" in nature? (No, in nature "waste" = "food.")

101. Search for Soil Dwellers

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objective: To learn that healthy soils contain a great variety of creatures and that many of these creatures help make soil fertile and healthy

Ages: Middle, older

Materials: White paper (large sheets, such as flip chart paper, are best) or white paper plates, tweezers or wooden toothpicks, trowels or shovels, small glass or plastic containers, buckets, magnifying glasses if available

Time: 30 minutes

Procedure:

Healthy soil provides habitat (food, water, shelter) for a large array of creatures. Scientists estimate that more than half the mass of soil is made up of living things.

Have the kids use trowels, shovels, or whatever else might be available to dig up soil samples and put them in a bucket. On a flat, comfortable surface (inside or outside), dump the soil onto white paper and ask the kids to root through the soil to search for creatures. They can move the creatures to the side of the paper with tweezers, toothpicks, thin twigs, or eating utensils or put them in small glass jars to view from all angles. For a closer look, the kids can use magnifying glasses if you have them. Creatures the kids might find include earthworms, millipedes, centipedes, ants, termites, mites, beetles, springtails, and spiders. Have the kids compare soil fauna from a variety of sites: forests, gardens, dry and wet places, eroded fields, under mulch, compost, etc. Then, once the kids have collected the creatures, ask the following questions:

1. Which soil samples have the most animals? (The healthiest soils)
2. What makes the soil healthy? (Typically, decaying organic matter; porous, loose texture; sufficient moisture)
3. Why do you think the healthiest soils have the most animals? (More to eat, sufficient moisture, tiny spaces for animals to live in)
4. What do you think these animals are doing in the soil? What do they eat? (Depending on the animals, they can eat decaying organic matter, other soil animals, dead wood, seeds, fruits, roots, animal wastes, etc.)
5. The animals themselves are vital to making the soil healthy. How do you think they do that? (Eating dead and decomposing material returns nutrients to the soil and makes it available to plants; burrowing through soil makes it porous, increasing its capacity to store water like a sponge and making oxygen available to soil creatures.)

Solid Waste Activities

Solid Waste Activities

102. Candy Creatures

Objective: To demonstrate the principle of decomposition and recycling

Ages: Young

Materials: Toothpicks or equivalent, pieces of soft food (e.g., candy, fruit, fried bread, donut holes)

Time: 20 minutes

Procedure:

This simple demonstration illustrates for young kids the idea of decomposition and recycling. Distribute toothpicks or their equivalent, and small morsels of food that kids would like. Ask them to build small creatures by poking the toothpicks into the food. Once they are done, make sure all kids get to see what everyone else has created. Now, tell them they are going to take the creatures apart, and ask how they should do so. They will likely suggest that they eat the food and use the toothpicks! But now ask them whether they should burn the creatures instead or throw them away. They shouldn't like these alternatives because no one will get to eat the food or use the toothpicks, and because it will create smoke and litter. This gives you the cue to point out that that's the way to think about waste disposal: Think about what you can do with trash before getting rid of it, polluting the air, and creating ugly sights in the process.

103. Countdown to Litter

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objectives: To heighten awareness of community litter; to infer why people litter

Ages: Young, middle

Materials: Sack or container, string, markers, ruler (optional), litter

Time: 45–60 minutes

Procedure:

In this activity, kids find litter in the community and measure how far it is from the nearest disposal container. Begin by organizing the kids into pairs and giving each a sack or some other container. Ask them to go forth into the community and find litter in one to three different sites. Define beforehand how small an item can be to count (a bottle cap? a cigarette butt?) and how large. When the kids find an item, they should measure how far it is from the nearest trash receptacle, either with their feet using the heel-to-toe method or with a piece of string on which you have marked off 1-foot or 1-meter intervals. They should record their results. After the kids have had sufficient time to complete their investigations, ask them to return and share their results. If they found trash with no receptacles in sight, they should say so. Who measured the shortest distance to a receptacle? Who measured the longest?

After all have been heard from, ask the kids to consider:

1. who might be leaving the litter, based on what it is (cigarette butts, candy wrappers, etc.);
2. whether the trash was left in close proximity to receptacles or far away from them;
3. why trash might be ending up on the ground instead of in a receptacle (people lazy or distracted, accidental, no receptacle around, litter blowing from full receptacles, wind blowing it in from elsewhere, animals scattering it, etc.); and
4. what might be done to reduce the litter.

104. The Garbage Dump Field Trip

Contributed by Peace Corps/Armenia

Objective: To learn about garbage disposal in the community and consider alternatives

Ages: Middle, older

Materials: Garbage Dump Field Trip Worksheet, writing utensils

Time: Depends on site visited

Procedure:

Distribute copies of the "Garbage Dump Field Trip Worksheet" to the kids, or to one kid who will serve as a recorder. Have the kids answer the questions, helping them with any unfamiliar concepts. In visiting the dump, which may be large or small, "official" or "informal," make sure the kids stay safe, away from such items as broken glass, rusty metal, and smoldering trash. Ensure that they are not breathing smoke or confronted with dump-frequenting animals such as feral dogs. Students may need to interview residents of the area or city officials for some of their information.

Courtesy of PC/Paraguay

Following the field trip, the kids can discuss how they can get the community to improve the situation (e.g., work to get a community recycling program underway, organize community cleanups, start a hazardous waste collection effort; encourage composting, moving the dump from vulnerable waterways or public gathering places, burying the trash, cessation of burning; fencing the dump to keep away stray dogs, livestock, and especially children; removing mosquito breeding sites).

The Garbage Dump Field Trip Worksheet

Your name: Date:

1. Identify, in writing, the location of the dump and its size (e.g., hectares, acres).

2. How do the people living in the surrounding areas use this dumping area as a waste disposal site? (Included should be a list of the major kinds of waste observed here.)

3. Dumps can be classified as sanitary landfills, rubbish burning dumps, or open dumps. Into which category does this dump fit? Why?

4. Is this a legal dumping area? (Does it conform to the legal statutes governing waste disposal?)

5. Is this dump a safety hazard? Is it accessible to little kids who can hurt themselves in it?

6. Do you note burning going on? Are toxic substances, like plastic, being burned? Is the smoke blowing into areas where people are breathing it?

7. Do you see items in the dump that should have been recycled or reused? What are they?

8. Do you find organic items that should have been composted? What are they?

9. Do you see hazardous waste items, such as motor oil, batteries, and pesticide containers, that are in the dump or even being burned? What are they?

10. Is there any evidence that animals inhabit the dump? If so, what kind? Do they appear to present health and/or safety problems?

11. Briefly describe the uses of the land areas immediately next to the dump. What kind of problems does the dump present to the people living there?

12. Are there any waterways within or near the dump site? Do they receive runoff from the dump? If so, what problems might this cause for downstream communities?

13. Is the dump an eyesore? Is it located where lots of people go, or is it out of the public view? Does it make the town significantly uglier than it has to be?

14. How long can the community rely on this site? What are future plans for waste disposal in this area?

15. Do alternatives to dumping exist in the community? If so, what are they?

16. Can the community reclaim the dump? Should they? If so, how? Are there legal restrictions or regulations governing the reclamation of garbage dumps?

17. What could your group do to attempt to improve the dump situation?

105. Litter Really Hurt Me

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objective: To learn how litter can harm people

Ages: Young, middle

Materials: Paper, writing utensils

Time: 30 minutes for meeting time following community surveys

Procedure:

In this activity, kids survey their parents and other adults to find out how they have been harmed by litter. Ask the kids beforehand to come up with questions and write them down on a piece of paper, which can serve as a survey. Or hand them copies of a survey that you have prepared beforehand (a sample is below). Ask them to record their answers. After sufficient time, reconvene the group to share results and discuss: What kind of litter is most likely to cause accidents? How can such accidents be prevented?

Note: Before asking kids to conduct surveys, make sure that this is culturally, politically, and socially acceptable. There are places where adults are suspicious of or offended by people, even kids, asking questions.

Survey

Have you ever been harmed or made sick by a piece of litter? (Circle your answer.) **No Yes**

If yes, what type of litter was it? (Answer below.)

1. **Name first type of litter to harm you:**
   What kind of medical attention did you need as a result?

2. **Name second type of litter to harm you:**
   What kind of medical attention did you need as a result?

3. **Name third type of litter to harm you:**
   What kind of medical attention did you need as a result?

Use the space below to describe any other types of litter that have harmed you and what medical attention you needed as a result:

106. Litter Relay: Reduce, Reuse, Recycle

Contributed by Peace Corps/Armenia

Objective: To learn to think about trash in terms of what should be reused, recycled, or thrown away

Ages: Young, middle

Materials: 10 pieces of clean litter for each team (e.g., cardboard, aluminum, plastic, paper, packaging), one container labeled "Reuse," one container labeled "Recycle," one container labeled "Throw away," markers or other writing utensils, copies of the litter planning sheet (optional)

Time: 30 minutes

Procedure:

Begin by making sure that your kids know why it's important to dispose of trash the right way, and why some categories of trash should be recycled or reused, rather than just thrown away. They should know that recycling is the process of taking an item and making it into another item, while reusing an item is the process of using it as it is, possibly with some alteration.

Divide the kids into teams and assign each team a number. Provide all teams with the same quantity and types of litter items (e.g., every team might have three pieces of aluminum, four pieces of scrap paper, and five plastic bottles) and ask each team to label each litter item with its respective number. Ask each team to sort its items into three piles—"Reuse," "Recycle," and "Throw away"—and to fill in their respective planning sheets. Ideally, each team will have the same number of each category.

Set up three containers (e.g., boxes, waste baskets, large bowls) in a row with "Reuse" closest, then "Recycle," and then "Throw away" farthest away from the kids. This setup reflects the amount of natural resources required to replace each item (i.e., the farther away, the more natural resources needed).

Once each team has assembled its pile, the game can begin. One person at a time from each team races to put one item in one of the containers, taking it from the three piles each group has made. In relay fashion, when the first kid from the team returns, the second kid races to place the next item in the appropriate container, and so on until all the items have been placed in the containers.

Award the teams points according to the order in which they finish (e.g., 5 points for fastest, 4 for second-fastest, and so on). But now also review the items in the different containers. For every item placed in the proper container (identified by their numbers), the team that placed it there gets an additional point. Add up the total amount of points to declare the winner.

Follow up by asking the kids how reusing and recycling materials accomplishes the following:

1. Conserve natural resources? (Fewer natural resources are needed because items are reused and recycled; fewer natural resources need to be extracted to make new items.)
2. Make the environment cleaner? (Less trash and litter)
3. Improve people's health? (Less burning plastic to breathe, less glass and metal that can cause injury)

What changes can the kids make to clean up their neighborhood? (Make less trash, buy in bulk, buy only returnable bottles, use plastic bags over again, fix old things rather than buying new, not littering, etc.) Could they do anything as a group?

Planning Sheet

Names of team members

_____

_____

Team #: _____

Type of Litter

Reused (how)

Recycled

Thrown away/Burned

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

107. Map Out Litter

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objective: To see where litter is a problem in the community and to develop ideas for coping with it

Ages: Middle

Materials: Paper, writing utensils

Time: Depends on amount of walking required

Procedure:

In this neighborhood survey, kids draw up a map of their survey area and mark on it where they find the most litter. Organize the kids into pairs and give each a sheet of paper, preferably a large sheet such as flip chart paper, and writing utensils, preferably markers if you have them. Assign each pair an area in their community, and ask them to draw a map of it showing significant features such as buildings and plazas. The kids should then mark with an "X" where they find the most litter and mark with a rectangle wherever they found trash cans. When they are all finished, ask the kids to share their results. Each team should describe:

1. where their area is,
2. what is in the map,
3. where they found litter, and
4. where they found trash cans.

After everyone has shared their results, solicit ideas as to what might be done to address community litter. Where are trash receptacles most needed? How can the residents be motivated to use them? Does a collection system exist that will periodically empty the receptacles? If not, can one be developed?

108. Mini-Dumps

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objective: To learn that different materials decompose at different rates (and some don't decompose at all)

Ages: Young, middle

Materials: Items to decompose: a leaf and pieces of bread, cotton cloth, cardboard, aluminum, tin, newspaper, wood such as a popsicle stick, iron such as a non-rusted nail, plastic, glass, containers for each group of kids (e.g., buckets, tubs, cut-off plastic bottles, glass jars—groups do not all need the same kind of container), soil

Time: Initial setup: 20 minutes; several weeks required to make observations

Procedure:

In this activity, kids bury various items in soil and see what happens to them over time. Organize the kids into pairs or teams, and give each group a few containers and one of each

of the items that will be decomposing. Ask the kids to put some soil into the containers, then an item or items, and then more soil, filling the containers. Add some water and set aside. After 10 days or so, spread out newspaper and ask the teams to sift through the dirt with sticks or pencils and record what they see. Replace the dirt and items in the containers, wait another 10 days or so, and repeat the procedure. Continue until the organic items have decomposed or until your kids get bored. Which items decomposed the fastest? Which ones may never decompose? What does this suggest about the best way to dispose of these materials?

109. Recycling Scavenger Hunt

Contributed by Peace Corps/Mexico

Objectives: To learn the types of recyclable materials; to help make community cleanups enjoyable

Ages: Young, middle

Materials: List of recyclables to find, garbage bags, hand sanitizer or soap

Time: 2 hours

Procedure:

This game can enliven community cleanups and raise awareness about litter.

Invite kids to share with the group the reasons we should recycle. Discuss the different materials that can be recycled locally and where they are collected. To prepare the scavenger hunt, identify which types of recyclables are commonly discarded on the ground and which are accepted by your local recycling center. Give each team of two to three kids a copy of a list of the items they will be searching for.

Explain the objective and rules. Determine a time limit and where teams can and cannot go. The team with the most recyclables—correctly separated, of course—wins. Subtract points from team scores for trash and minutes late. Below is a sample list of recyclable materials and their point values:

- Caps or tabs: 1 point each
- Plastic bottles: 3 points each
- Glass bottles: 5 points each
- Cardboard: 5 points each
- Aluminum cans: 8 points each
- Batteries: 10 points each

Be sure to bring hand sanitizer or soap and water for students to clean up afterward.

Courtesy of PC/Panama

110. Ruling Out Litter

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objectives: To heighten awareness of the ugliness of litter; to motivate kids to develop litter cleanup strategies

Ages: Young, middle

Materials: Litter

Time: Several meeting periods

Procedure:

In this activity, kids make their meeting space into a "littered neighborhood"! Over a period of several meetings, during which the kids are doing whatever projects they would be doing

otherwise (art projects are best because they are messy), inform the kids that they are to leave all waste (as long as it doesn't create a health hazard) on the floor. After the room becomes an unpleasant mess, ask the kids:

1. How they feel being in the room
2. Whether they understand why littering is a bad idea
3. Where they notice litter in their actual neighborhood
4. What they might want to do about it

Wrap up the activity with a cleanup party, during which the kids finally dispose of their mess properly.

111. Timeline for Decomposition

Compiled from contributions by Peace Corps/Armenia, Peace Corps/Mexico, and Peace Corps/Paraguay

Objective: To understand the differences between the different types of garbage and how long they remain in the environment

Ages: Young, middle

Materials: Long piece of string, index cards, garbage items (e.g., paper, cardboard, fruit scraps, rubber, plastic, tin, glass), marker

Time: 30 minutes

Procedure:

Before the activity, lay out the string and mark time intervals on it using the marker, trying to space them according to the time scale. Points in the line include 1 week, 2 weeks, 3 weeks, 1 month, 2 months, 3 months, 4 months, 5 months, 6 months, 1 year, 2 years, 5 years, 10 years, 20 years, 50 years, 100 years, 200 years, 300 years, 400 years, and 500 years. Label the points using index cards.

Now, give each kid a piece of garbage and ask them to place their item at the place on the timeline that indicates how long they think it takes to decompose in the environment. Once they have done this, reveal the actual decomposition times to the group, using the decomposition table.

Follow up by asking the kids if anything surprised them about the decomposition times. Ask them why they think some substances take longer than others to decompose. Discuss the difference between organic and inorganic waste. Ask the kids how they feel about this information and about trash, and whether they might want to do something to improve the situation in the community.

Garbage and Decomposition Times

(**Note:** Though the figures below come from authoritative sources, these are best-guess estimates. No one has been around for 1 million years to prove that this is the time required for glass bottles to disintegrate! Furthermore, decomposition times vary according

to temperature, rainfall, soil conditions, and other environmental and climatic factors. Decomposition occurs much more rapidly in a tropical rain forest than in the Sahara or Atacama Desert or in the high Himalayas.)

- Paper towel (2–4 weeks)*
- Orange peel (2–5 weeks)**
- Cotton cloth/rag (1–5 months)**
- Milk carton (3 months)*
- Aluminum can (80–200 years)*
- Plastic bottle (450 years)***
- Glass bottle (1 million years)*

* des.nh.gov/organization/divisions/water/wmb/coastal/trash/documents/marine_debris.pdf

** www.cvwma.com/storage/File/Trashytimelinekit.pdf

*** www.miwaterstewardship.org/youthstewards/factsaboutwater/testyourknowledge/householdwastethatsgarbage

112. Trash Corners: Organic, Inorganic, or Toxic?

Contributed by Peace Corps/Dominican Republic

Objective: To learn the various categories of garbage, the necessary first step toward learning how best to dispose of it

Ages: Young

Materials: Paper, marker, tape, source of music (e.g., CD player, you with voice, guitar)

Time: 20 minutes

Procedure:

This is an active game in which kids can test their knowledge of trash categories while getting a lot of exercise. Prior to the activity, write "Organic," "Inorganic," and "Toxic" on three sheets of paper and tape them in three different corners of the room (or on three separate trees outside). Prepare a list of trash items found in your community, placing them in these three categories. Examples:

- **Organic:** coffee grounds, food scraps, banana peels, bread crusts, paper, paper towels, cardboard
- **Inorganic:** Plastic soda bottles, glass, yogurt cups, spoons, cellophane, aluminum cans, plastic bags
- **Toxic:** Batteries, pesticide containers, medicine bottles, motor oil, cell phones

Gather the kids and explain that there are three types of garbage. Ask if they know what they are and what they are called, and then define:

1. Organic waste: All waste of biological origin (which was once alive or part of a living thing).
2. Inorganic waste: All waste from non-biological origin (industrial origin or any non-natural process).
3. Toxic trash: Trash that releases dangerous substances, such as toxic chemicals and poisons.

Having cleared a space in the middle of the room or outside, get the kids out there running around, dancing, etc. Begin playing music, but periodically, stop and yell a particular kind of garbage: e.g., "Mango husks!" The kids should race to the station where they think the item belongs. Those who raced to the wrong station have to sit down. Those who ran to the right station get to keep on dancing or running around. Play until only one participant remains.

113. Useful Waste

Adapted from Super Saver Investigators *(Peace Corps Publication No. FC155)*

Objective: To identify categories of waste that can be reused

Ages: Young, middle

Materials: Various types of solid waste (e.g., aluminum cans, tin cans, glass bottles, plastic beverage bottles, cigarette butts, empty bug spray cans, orange peels, bottle caps, pages of newspaper)

Time: 20 minutes

Procedure:

Divide the kids into pairs or small groups, and give each the same examples of trash. Ask each group to arrange them in order of their usefulness, with the most useful at one end and the least useful at the other. Once they are finished, ask each team to explain their reasoning; teams may come up with original ways of reusing trash that the others haven't thought of. After the exercise, the kids can glue or tape the trash to poster board according to the hierarchy of usefulness the kids have developed and make an exhibit for a school or community center.

114. What Was My Life?

Source: U.S. Environmental Protection Agency, EPA Pollution Prevention (P2) Education Toolbox

Objective: To learn that the "life" of all consumer products has three phases: production, use, and disposal

Ages: Middle

Materials: An empty spray can (or spray bottle) formerly filled with a nontoxic substance (such as a cleaning product or hairspray). Tape an "insect-killer" label to the can and pretend that it is half-full.

Time: 20 minutes

Procedure:

Arrange your kids sitting down in a horseshoe. The object of the activity is to share with the class something about the life cycle of the "insect killer." Kids on the left side of the horseshoe represent the insect killer being produced. Kids in the middle represent the insect killer being used. Kids on the right side represent the can being disposed of.

Hand the "insect killer" to a kid in the center of the horseshoe. This kid may start by saying something such as "I am being used to kill ants in the kitchen." Have the middle kids pass the can among themselves and discuss different ways it is being used. Pass the can to the production kids. They may say things such as "Before I go to someone's house, materials such as steel, plastic, and paper are bought by the factory to put me together." Pass the can to the disposal kids. Guide them to come to conclusions like "I am being thrown into the garbage, and I am headed for a landfill." Conclude the trip around the horseshoe with a discussion of raw materials used (for example, metal, plastic, paper, hazardous insect killer); wastes produced during the production and use of the can; and pollution that may result from the improper disposal of a can that is not yet empty.

Courtesy of PC/Senegal

Tree Activities

Tree Activities

115. Adopt-a-Tree

Compiled from contributions by Peace Corps/Armenia, Peace Corps/Mexico, and Peace Corps/Paraguay

Objectives: To learn how to identify local trees; to develop observational skills using a range of senses

Ages: Young

Materials: Blindfolds

Time: 30 minutes

Procedure:

Divide the group into pairs, and blindfold one member of each. Have the seeing partner take his or her blindfolded partner to a particular tree within 20 to 30 yards of where they are standing. Help the blindfolded kids learn everything they can about their tree by calling out such hints as "Is your tree still alive? How does it smell? How does its bark feel? Can you reach its leaves? If so, how do they feel? Smooth? Rough? Toothed or smooth edges? Can you put your arms around the tree? Can you find plants or lichens growing on it? Does it make a sound when the wind blows?"

When the blindfolded partners are done exploring, the seeing partners lead them back to where they started. (This is the fun part, where lead partners can come up with imaginary objects—logs, streams, rocks, etc.—to step over and can turn their partner in different directions so as to entertainingly mislead them from finding their tree.) Now, when they have returned to the starting point, the kids remove their blindfolds and try to find their trees. What was once a forest now becomes many individual trees. Repeat the activity with the other partner.

Variation:

You can also reverse the order of activity. This time, the kids can walk up to a tree, greet it by shaking a branch and saying, "Good morning," and then hug the tree, feeling the bark with their cheeks, arms, legs, and hands. They can smell the bark, listen to the sound it makes against their clothing, and hear the sound the wind makes as it blows through the leaves. Ask them to describe what they notice and, after a few trees, how the different barks compare. If you have given names to the trees, you can then have the kids return to a gathering spot, blindfold the kids, and ask seeing partners to guide them to the trees they just looked at, which the kids will try to identify based solely on their impressions of the bark, smells, and sounds.

As a follow-up, the kids can adopt their individual trees. They can do such activities as

- drawing a picture of their tree,
- writing a poem or story about it,
- taking care of it for a period of time (e.g., watering it and fencing it so livestock can't damage it),
- learning its name and labeling it so others can learn what it is,

- collecting its seeds and planting them,
- collecting the insects that live on the tree and attempting to raise them in a glass jar, and
- noting the birds and other animals that have been seen in the tree.

116. The Benefits of Trees

Contributed by Peace Corps/Dominican Republic

Objective: To increase appreciation of trees

Ages: Young, middle

Materials: Paper, paint and brushes or crayons, writing utensils

Time: 15 minutes

Procedure:

Ask each kid to think of a tree that he or she likes and why. For example: "This tree always has many guavas, it gives good shade, it looks nice." Ask them to illustrate their tree as accurately as they can and to write down its benefits. After the kids complete their drawings, they can put them on the wall as an exhibit.

117. Gifts From Our Trees

Contributed by Peace Corps/Paraguay

Objective: To appreciate the services and products provided by trees and forests

Ages: Young, middle

Materials: A writing surface, white paper, colored pencils or brushes, tape or glue, string, tacks, chalkboard or flip chart paper

Time: 45 minutes

Procedure:

Begin by drawing a tree with roots, stem, and crown on a chalkboard or on a sheet of flip chart paper. Now, talk with the group about the importance of trees in our daily lives. What gifts do trees give us? Write down their responses, which may include wood, firewood, fruit, medicine, bark, leaves, compost-rich soil (preventing erosion), water (promoting infiltration and transpiration), windbreaks, shade, beauty, and animals (providing habitat). Assign each kid a tree, and have them draw its gifts. Then ask them to hang the gifts on the appropriate part of a fictitious tree drawing you make.

Alternatively, instead of drawing a tree, you can select an actual tree nearby with branches low to the ground and accessible to kids. In this case, each kid would find an object that represents a tree gift and hang the object on the tree with string.

Discussion Questions:

1. Can we survive without tree products, the gifts of our forests?
2. What can we do to continue to enjoy these gifts?

118. Leaf Hunt

Objective: To develop the kids' skills in identifying trees

Ages: Young, middle

Materials: None

Time: 20–30 minutes

Procedure:

Organize the kids into pairs. Give them 10 minutes or so to gather only one leaf from as many different trees as they can find. When they reconvene, they lay their leaves out on the ground. Going in order, one team holds up a leaf, and the first team that holds up the identical leaf gets five points. If a team has not made a correct match, it gets no points, but the next team that does get the answer correct scores. If no team has the matching leaf, the team holding up the leaf gets 10 points. If you have taught the kids the names of the trees and how to identify them beforehand, the teams can get extra points for correctly identifying the leaves.

119. Leaf Matching

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objective: To learn how to identify different kinds of trees by their leaves

Ages: Young, middle

Materials: Leaves from various trees, markers, index cards or small pieces of paper, writing utensils

Time: 30 minutes

Procedure:

Collect leaves—alive or dead—from a range of tree species. Once you have done this, you can use the leaves in a variety of identification activities:

- **Leaf groups:** Take equal numbers of leaves of different kinds of trees and distribute them evenly among the kids, one leaf for each person. Have the kids then find the others with the same kinds of leaves.
- **Describe your leaf:** Each kid (or pair of kids) can write a brief description of their leaf on an index card or small piece of paper, listing as many details as possible. The leaves can then be put in a pile. Shuffle the cards, distribute them to the kids, and have each kid in turn try to match the description to the leaf. Every correct answer earns a point for both the identifier and the leaf describer.
- **Where's my leaf?** Ask each child to make an identifying mark on the bottom of their own leaf. Then ask the kids to return their leaves to a pile, making sure the marks are not showing. You can also combine the leaves with others to make the game a little more challenging. After stirring up the leaves a bit, ask each child to find their particular leaf (without looking for the mark). While the leaves are picked or after every child has found their own leaf, ask them to describe to the rest of the group how they knew which leaf was theirs.

120. Leaf Rub Game

Objectives: To begin to develop observational skills; to begin to appreciate how tree leaves can be different from one another

Ages: Young

Materials: Paper, crayons or pencils, marker, leaves

Time: 30 minutes

Procedure:

In this activity, young children make simple artwork to use in a leaf-matching game. Ask the kids to bring in three leaves each. They can bring them from home or go out and search for them just before the activity begins.

Once they have collected their leaves, distribute to each kid at least four sheets of paper and some crayons or colored pencils. Ask the kids to press each of their leaves between two sheets of paper and lightly draw a crayon or pencil across the area where the leaf was placed. As they do this, make a small mark with your marker on the leaf-rub and an identical mark on the underside of the leaf that the leaf-rub portrays. (Use different marks, perhaps numbers or letters, for all leaves.)

When the kids are done, collect the leaf-rubs and the marked leaves. Shuffle the leaves and line them up on the ground or on a table. Divide the leaf-rubs evenly among the kids, making sure that no kid gets his or her artwork. Once everyone has their leaf-rubs, ask each kid, one by one, to select one of their leaf-rubs and to go over to find the leaf it illustrates. If the marks on both the leaf-rub and the leaf match, the kid gets a point. If the kid guesses the wrong leaf, no point is awarded. (You may prefer not to keep score and award points.) In either case, keep the leaf where it is and ask the next kid to give it a try with one of their leaf-rubs. The game ends when one of the kids has matched all their leaf-rubs correctly. Once the game is over, you can hang the kids' artwork on the classroom walls.

121. Our Ideal Tree

Contributed by Peace Corps/Mexico

Objective: To learn basic facts about trees

Ages: Young

Materials: Lots of different colors of paper, tape, markers, crayons, colored pencils, cardboard (optional)

Time: 2 hours

Procedure:

An arts-and-crafts project for young children: Prior to the session, cut out the trunk and branches of a tree from large strips of brown paper or cardboard. Attach the strips of paper together on the wall to form the trunk and branches. Be sure to properly support the tree and keep in mind that it will weigh more after it is decorated.

Courtesy of PC/Mexico

Now, ask the kids to name different products, such as fruits, seeds, berries, and flowers, that grow on trees, as well as the different living things that depend on or live in them. Now they can decorate your tree. They can start by cutting out leaves from colored paper and taping them on the branches; they can then add fruits, berries, seeds, flowers, and other features. Finally, the kids can draw and color animals that utilize or depend on trees (squirrels, ants, butterflies, lizards, etc.). For younger kids, you can print or draw animals in advance.

Variations:

Ask the kids to think about daily actions that they can take to benefit the environment, support biodiversity, or increase conservation (e.g., conserving water, turning off lights, walking, using both sides of paper, and planting a garden). The kids can then cut out large paper leaves, write their ideas on them, and attach them to the tree. Or on large paper leaves the kids can write short descriptions of their ideal world, or perhaps changes they would like to see in their community. These changes can be attitude changes, such as toward garbage, or something fun and crazy that they would like to have in town, like a giant rollercoaster. They can attach these, too, onto the tree. They can also write the names of local tree species on the paper leaves.

122. Plant Presses

Adapted from Peace Corps manual Environmental Education in the Community *(No. M0075)*

Objectives: To learn the plants that grow in a local area and to display them so that others can learn about them

Ages: Young, middle, older

Materials: Plant press or equivalent (e.g., large, flat rocks or stacks of books), sturdy cardboard (cut into 10-inch squares), sheets of white paper, scissors, newspaper, string, identification tags, plastic bag, writing utensils

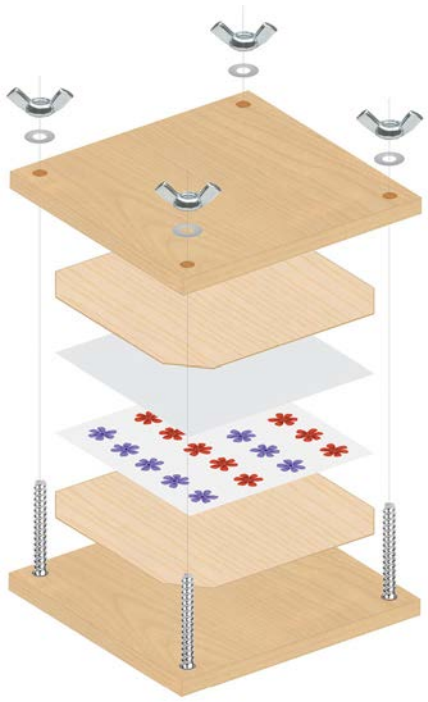
Time: 2–3 hours

Procedure:

If you can obtain a plant press, you can prepare leaf specimens that last and that can teach others how to identify plants.

Start by describing the process of pressing plants. Explain that pressing plants dries them out and minimizes their exposure to oxygen and microbes that would break them down; this process allows them to last longer and not rot.

Then go for a hike to collect plant samples. Kids should be instructed to only pick fresh, live plants and no more than they need. A few leaves, flowers, and/or seeds can make a great children's display.



Plant Press

Bring your findings back to a large table. Create plant identification tags and place the samples and tags in your press, such that two or three sheets of newspaper are on either side of the plant sample. Suggested tag information: name of plant, name of collector, date collected, location where the plant was found, plant uses, plant description (if only partial sample available or feasible).

The basic idea is to place plant specimens between the absorbent sheets of newspaper, and then apply pressure to press them flat and allow them to dry with minimal loss of color and detail. If a press isn't available, large rocks or stacks of books might be heavy enough to apply sufficient pressure. The newspaper is placed between layers of cardboard, and finally all the layers are placed between two pieces of wood and pressure is applied.

The size of the press should depend on how many specimens you want to press at one time. You may need to change the paper after two or three days, depending on moisture content. Once completely dried, the specimens should be taped to sheets of white paper, ideally with very thin strips of tape. Identifying tags should be glued to the paper. Kids can make a booklet of their samples or put them up on the wall for a display.

123. Seed Mosaics

Objective: To learn and appreciate the diversity of seeds

Ages: Young

Materials: A variety of seeds, glue, paper or cardboard

Time: 20 minutes

Procedure:

Collect a variety of seeds, as many different types as you can, and/or ask the kids to do so. The kids can glue them to paper or cardboard to make mosaics, making pictures, designs, or whatever else comes to mind.

124. Tree Detectives

Objective: To identify common tree species using their various physical characteristics and scrutinizing the differences between them

Ages: Young, middle

Materials: Tree diagram, paper, pencils, spray bottle (optional), tree guide (optional)

Time: 30 minutes

Procedure:

This is an active game that teaches kids how to identify trees in their neighborhood by considering all of the trees' features.

Go outside and ask the kids if they know the names of any nearby trees. After assessing their knowledge, show the kids some common trees and how to identify them, considering the shapes and textures of the leaves, as well as the bark, twigs, flowers, fruits, and seeds.

Next, collect leaves, seeds, or fruit from the trees that the kids have just learned the common names of—if possible, items that are already on the ground—and place them in a pile in an open space. Organize the kids into teams, and explain that they will have a relay race. Call out the name of a tree. The first kid in each team should run to the pile and search for the corresponding leaf, seed, or fruit. Each correct item is worth one point. Depending on the level of the group, you might want to call out a leaf shape or its fruit or seed instead of its species or common name.

125. Tree Hands

Contributed by Peace Corps/Mexico

Objective: To increase appreciation of trees

Ages: Young

Materials: Cardboard, colored paper, glue, markers, scissors

Time: 45 minutes

Procedure:

This is a simple arts-and-crafts project for young children. Help the kids trace their hands and most of their forearms on a piece of cardboard, then have them cut the outlines out. Their arms will be the trunks of trees and their fingers will be the branches. The kids now cut out small paper leaves that can then be glued onto the branches. They can also draw and cut out birds, butterflies, and other animals that live in the trees and write meaningful words and quotes on their trees. To keep the trees upright, create a base or attach a small, folded piece of cardboard to its back.

126. Tree Identification

Adapted from Sharing Nature With Children

Objective: To learn how to identify common trees

Ages: Young, middle

Materials: Tree specimens (e.g., leaves, fruit, and flowers)

Time: 30 minutes

Procedure:

Once kids have learned how to identify some trees, they can review their knowledge in this active, simple game. Before the game, collect small samples of leaves, flowers, seeds, fruit, cones, etc. from trees and bushes. Form two equal teams lined up and facing each other

about 10 yards apart. Have the teams count themselves off so that there are two of each number represented. Next, line up the samples between the two teams. Announce, one by one, the name of a plant or tree, and then call a number to go fetch it first. Getting the correct plant lands a team two points; if incorrect, the team loses two points.

127. Tree ID Relay

Adapted with permission from IWLA's Engaging Youth in the Outdoors

Objective: To identify the differences in leaves from various tree species

Ages: Young, middle

Materials: Small branches or twigs from various species of trees

Time: 20 minutes

Procedure:

This simple running game allows kids to practice observation and identification of trees in an energetic and playful relay and is best done with at least six people.

Divide your participants into small groups of two to four players, each group sitting together in a circle. Give the first group several twigs/small branches from one tree species, give the second group several branches from a second species of tree, and so on. Ask the groups to carefully observe the traits of "their" tree. Do the leaves have teeth along the edges? What is the general size and shape of the leaves? Are the leaves attached to the branch directly opposite from each other or do they alternate along the branch? Are there buds on the branches?

While the teams are studying their branches, mark a starting line using sticks, rope, or any other object you have on hand. Line the kids up in their groups behind the line. Then walk a distance away (say, 20 yards) and spread all the twigs/small branches around in random order. You will need to have at least as many samples of each species as there are kids on a team; a few more is better.

Explain that this will be a relay race. When you give the signal, the first team member in the line should run to the line of twigs/branches, pick up one from their team's tree, race back, and tag the next player. Mentors will need to be standing with each team to ensure that the correct branch is selected by each team member. The first team done with the correct branches wins. You can play the game more than once, giving each team a different species each time. To make the game more challenging, put out branches of trees that were not assigned to any of the groups.

Variation:

This version requires all players to become familiar with all of the trees before the game begins. Divide the kids into teams, and have the teams face each other about 30 feet apart. (Mark the lines for each team.) Kids on both teams count off and receive a number (1, 2, 3, 4, etc.). The samples of branches are placed between the two groups. The game begins when you call out the name of a tree branch and a number. (For example, "The next plant is a Moringa tree, and the number is four.") The person who is number 4 on each team races to the center and selects the Moringa branch. The first one back to their line with the correct answer gains two points for their team; wrong answers result in a deduction of two points.

128. Tree Life Cycle

Contributed by Peace Corps/Armenia and Peace Corps/Mexico

Objective: To learn the life cycle of a tree

Ages: Young

Materials: None

Time: 15 minutes

Procedure:

Gather the kids so they can see and hear you. Ask them to act out the life cycle of a tree as you describe it, perhaps acting the life cycle out yourself as you do! Tell the kids the following:

1. You're a seed! (Curl up in a tight ball.)
2. You've sprouted! (Uncurl and kneel.)
3. You've grown a branch! (Stick up one arm with fist clenched.)
4. You've grown another branch! (Stick up the other arm.)
5. You've grown lots of leaves! (Wiggle your fingers.)
6. You've grown tall! (Stand up with feet together.)
7. You've spread out lots of roots! (Spread feet apart.)
8. You've grown lots of little roots! (Wiggle your toes.)
9. You've been attacked by insects and fungi! (Start scratching all over.)
10. You've been hit by lightning! (Make a loud noise.)
11. You've become a home for wildlife in your old age! (Smile and sigh.)
12. Woodpeckers peck into your dead wood! (Make a hammering noise and vibrate.)
13. You blow down in a storm! (Make a creaking sound and fall down.)
14. A new seed sprouts from your rotting wood! (Stick up one arm while lying down.)

The kids can also act out their own tree life cycle or think of other events that might affect a tree.

Variation:

These tree life cycle stages can be the theme for a scavenger hunt. Pairs of kids go out and try to find examples of different objects (e.g., a seed, a sprout, a branch, a tree with lots of leaves, big roots, lots of little roots, evidence of insect attack, evidence of an animal living in a tree, a dead tree, a dead tree with evidence of animals boring into the wood, a fallen log, a sprout coming out of rotting wood). Extra points or a prize for anyone who finds evidence of a lightning strike!

129. Tree Planting Steps

Contributed by Peace Corps/Paraguay

Objective: To learn the steps for planting trees

Ages: Young

Materials: Index cards or pieces of cardboard, drawing or writing utensils, clear tape

Time: 15 minutes

Procedure:

This simple exercise prepares young kids to plant trees. Begin by making cards that illustrate, either with words or drawings, the steps for tree planting (or ask the kids to draw the steps). The drawings and words are on one side; on the other, you or the kids can write an inspiring phrase, such as "We plant the future!" You can laminate the cards with clear tape to prevent damage to the drawings. The following steps come from Peace Corps/Paraguay:

- Cleaning the site
- Digging a hole
- Obtaining the plant
- Watering the seedling
- Removing the plant from the pot
- Placing the plant in the hole
- Covering the roots with soil
- Gently packing the soil around the tree
- Watering the plant in its new home
- Putting up a fence to keep animals from eating the seedling

Once the cards are ready, ask volunteers to come forward to share a card with the rest of the group. Then ask the group to sort the cards in order to learn how to plant a tree properly.

130. Tree Planting Tips for Groups

Contributed by Peace Corps/Jamaica

Objective: To organize groups of kids in tree-planting projects so that everyone is engaged

Ages: Young, middle, older

Materials: Tree saplings, compost, buckets, wheelbarrow or other device for transporting compost, tools (e.g., shovels, forks, grub hoes), materials to look for in the environment (e.g., rocks, twigs, mulching materials such as grass clippings or shredded leaves)

Time: 2–3 hours

Procedure:

Peace Corps Volunteer Mark Zajac from Jamaica has come up with this strategy for organizing groups of kids (even 20 or more) in tree-planting projects without turning the event into a chaotic mess.

Break the group into teams and give each a particular task, perhaps including the following:

- A **Compost Team** to transport previously prepared compost to where the trees are going to be planted. If you have a wheelbarrow, that can be an effective recruiting tool, because many kids enjoy them.
- A **Watering Team** to carry buckets of water. It is good to have a few strong guys to help, but don't dismiss girl power! Because water can be heavy, especially in full 5-gallon buckets, kids quickly learn the benefits of teamwork.
- A **Mulching Team** to scout for dry leafy materials.
- A **Digging Team** to dig the holes for the seedlings. This may turn out to be the most popular team, especially when the kids see the tools, so you might tell them that everyone will get a chance to dig as you can rotate the teams. To keep it as organized as possible, create a queue to know which kid will use the tool next, and allow each to have a number of swings.
- A **Planting Team** to actually take the tree, remove the plastic bag, loosen the roots, place it in the hole, and cover it up.
- A **Rock Gathering Team** (optional) to gather up rocks (preferably white ones so they are easy to spot) and form rock circles around the trees. Make sure the mulch doesn't cover up the rocks.

Courtesy of PC/Mexico

Safety Notes: Make sure there is always an adult present. Don't let the tools be used unsupervised. Be sure to show the kids the proper ways to use the tools. If the kids use a pickax or grub hoe, make sure they look behind themselves before swinging. Tell the kids to keep good safe distances from each other when they use the tools. Advise the kids not to "choke up" on the tools (holding them too close to the head); this will help them hit the ground and not their feet! Finally, remind them not to become too confident with their tools; once kids think they have mastered a tool, they can get careless and someone can get hurt.

131. Tree Tag

Adapted from 101 Nature Activities, *with permission from Sanborn Western Camps*

Objective: To develop kids' skills in identifying trees

Ages: Young, middle

Materials: None

Time: 30 minutes

Procedure:

This familiar game tests kids' tree knowledge. Locate an open area where kids can play tag and ensure that they know where the boundaries are. When the game begins, call out the name of a tree that the kids can touch to be "safe." Of course, they have to know how to identify the tree; otherwise, they will go to the wrong ones. Regularly call out new "safe" trees so the kids have to move around and demonstrate they know more trees.

132. Tree Treasures

Contributed by Peace Corps/Armenia

Objectives: To learn the many products that come from trees, find out which forest products are recyclable or reusable, and recommend actions for conserving forest resources

Ages: Young, middle

Materials: Magazines with pictures of wood products or paper and drawing utensils, scissors, tape

Time: 30 minutes

Procedure:

Before you begin, gather old magazines with plenty of advertisements and cut out pictures of products derived from trees. Or if magazines are not available, draw different products from trees on separate sheets of paper. Examples should include wood products, paper products, food products, and miscellaneous products such as medicines, fibers, flowers, and homes for honeybees. Make at least one picture per kid. Around the room, tape pieces of paper that say "wood products," "paper products," "food products," and "miscellaneous products."

Start the activity with a brainstorming session. Ask the kids to name as many tree products as they can think of, listing their ideas on a flip chart or chalkboard if you have one. After a few minutes, look back over the list. Which products do the kids use every day? Which are made totally from trees? Which are made partially from trees?

Now tell the kids that they are going to be tree detectives! Assign each kid a mystery product by taping a tree-product picture to each kid's back. Tell the kids they must figure out the identity of the product on their back by asking each other questions, which can only be answered "yes" or "no." Give the kids time to mingle; they can ask each person only two questions. In this manner, each kid will gather clues about a "mystery tree product" and try to figure out what it

is. When a kid knows what his or her product is, he or she needs to decide which category the product belongs in: food, wood, paper, or miscellaneous. He or she can then go stand in the appropriate product category area designated by one of the four signs on the wall.

The kids gathered by each category can now share with the others why they think they belong in that group. If a kid has misidentified his or her product or is standing in the wrong category, others in the group should provide more clues until the product's identity or category becomes apparent. Kids should also discuss whether their products could fit in more than one category. Allow kids to change groups if they see fit.

Afterward, revisit the list of tree products the group brainstormed earlier. Have the class identify categories each kid belongs in. See if kids can name other products that come from trees. Talk about unusual tree products such as chewing gum, turpentine, spices, medicines, and others. You may want to bring in samples of some unusual tree products.

Kids may want to think about how they could use forest products in a way that helps to extend and conserve forest resources. They can explore ways to remove forest products from the waste stream (e.g., reuse paper bags, recycle newspaper).

Variation:

Have kids gather into groups based on what part of the tree their product is derived from—leaves, fruits, flower, wood, bark, sap, roots: Label sections of the room according to these tree parts. Tape pictures to the kids' backs and have them guess their identities as in the activity above. After guessing, they should go to the proper "tree part" section.

Tree Products

- **Cellulose Products:** Carpeting, cellophane, rayon and other fabrics, thickening agent in shampoos, suntan lotion, cosmetics, paper products, fiber board, imitation leather
- **Bark Products:** Cork, tannin (used for curing leather), dye, drugs and oils
- **Sap Products (Gums and Resins):** Cosmetics, paint thinner, perfumes, soap, rubber products, sugar and syrup, varnishes, waxes, chewing gum, flavoring, printing ink, shoe polish, crayons, cleaning fluids, electrical insulation, adhesives

133. Writing a Tree Identification Guide

Objectives: To identify neighborhood trees; to develop language skills

Ages: Middle, older

Materials: Paper, writing utensils

Time: 1 hour

Procedure:

Prior to the activity, locate and identify a number of trees in your neighborhood. How many will depend on how many tree species you can find and identify and on how many kids you will be working with.

To begin the activity, divide the kids into teams of two to three. Give each team an equal number of slips of paper and at least one writing utensil.

Assign each team an equal number of trees, show the team where its trees are, and tell it what they are. Now, ask each team to find the characteristics of each of their trees that distinguish them from other trees (leaves, bark, fruit, twigs, shape, seeds, odor, etc.). On separate slips of paper, each team then writes the name of each tree and two to three identifying characteristics in bullet form as clearly and unambiguously as they can. After the kids are all finished, reconvene the group and collect their slips of paper. Shuffle them and distribute them evenly among the teams. If any team gets a slip that it has written, ask it to exchange with another group.

Now every team goes out to try to locate the trees described on their slips of paper, using the identification clues they contain. When a team thinks it has located the right tree, it tells you what it thinks. If they get the tree right, their team and the team that wrote the clues each gets a point. If the team doesn't identify the tree correctly, ask them to try again. Once a team finishes, you can call everyone back and figure out point totals. Or you can let the game continue until every team has finished.

As a follow-up, the kids can incorporate their information into a community tree guide, perhaps adding hand-drawn illustrations. The guide can be posted on a school or community bulletin board. If you can make copies and staple or tape the sheets together, you can distribute to kids or community residents. The kids can also put up labels made of wood or some other durable substance identifying the trees.

Courtesy of PC/Armenia

Bibliography and Appendix

Bibliography

Conant, Jeff and Fadem, Pam. 2008. *A Community Guide to Environmental Health.* Hesperian Foundation.

Cornell, Joseph. 1979. *Sharing Nature With Children.* Ananda Publications.

Fox, Hannah. 2010. *Zoomy Zoomy*. Tusitala Publishing.

Hillcourt, William. 1970. *The New Field Book of Nature Activities and Hobbies*. Putnam Publishing Group.

Izaak Walton League of America (IWLA). 2012. *Engaging Youth in the Outdoors*. Gaithersburg, Maryland: IWLA Chapter Relations Department.

Izaak Walton League of America (IWLA). 2015. *Creek Freaks Curriculum*.

Lingelbach, Jenepher, ed. 1986. *Hands-On Nature.* Woodstock, Vermont: Vermont Institute of Natural Science.

Peace Corps. 1988. *Super Saver Investigators* (No. FC115). Reprinted with permission from the Ohio Department of Natural Resources; no longer in circulation.

Peace Corps. 1993. *Environmental Education in Schools: Creating a Program That Works* (No. M0044). Washington, DC: Peace Corps.

Peace Corps. 1994. *Teaching in the Whole Garden* (No. R0085). Reprinted with permission from Jana Potter, Peace Corps Volunteer, National Dissemination Project, UNDP/UNESCO SIL/85/009. Sierra Leone, 1987.

Peace Corps. 2005. *Environmental Education in the Community* (No. M0075). Washington, DC: Peace Corps.

Peace Corps. 2015. *Intensive Vegetable Gardening for Profit and Self-Sufficiency* (No. R0025). Washington, DC: Peace Corps.

Sanborn, Jane and Rundle, Elizabeth. 2011. *101 Nature Activities.* Sanborn Western Camps. Monterey, CA: Healthy Learning Learning.

U.S. Environmental Protection Agency. 1997. *EPA Pollution Prevention (P2) Education Toolbox.* United States Environmental Protection Agency EPA-905-F-97-011.

Appendix A.
Peace Corps Child Protection Policy (MS 648)

1.0 Purpose

The purpose of this Manual Section is to set out the policy on proper conduct while working or engaging with children during Peace Corps service or employment. It also establishes the process for reporting instances of child abuse or exploitation by an employee or Volunteer. The Peace Corps strongly supports measures to reduce the risks of child abuse and exploitation caused or perpetrated by an employee or Volunteer.

2.0 Authorities

22 U.S.C. §2504(a); 22 U.S.C. §2506(c).

3.0 Definitions

(a) **Child** is defined as any individual under the age of 18 years, regardless of local laws that may set a lower age for adulthood.

(b) **Child Abuse** includes four categories of abuse:

(1) **Physical Abuse** means any non-accidental physical injury (ranging from minor bruises to severe fractures or death) as a result of punching, beating, kicking, biting, shaking, throwing, stabbing, choking, hitting (with a hand, stick, strap, or other object), burning, or otherwise harming a child.

(2) **Emotional Abuse** means the actual or likely adverse effect on the emotional and behavioral development of a child caused by persistent or severe emotional ill treatment or rejection.

(3) **Sexual Abuse** means the employment, use, persuasion, inducement, enticement, the manipulation, or coercion of any child to engage in, or assist any other person to engage in, any sexually explicit conduct or simulation of such conduct, including for the purpose of producing a visual depiction of such conduct (i.e., photography, videography); or the rape, molestation, prostitution, or other form of sexual exploitation of children. It includes any behavior that makes it easier for an offender to procure a child for sexual activity (i.e., grooming of a child to engage in sexual activity).

(4) **Child Exploitation** means any actual or attempted abuse of a position of differential power or trust with respect to a child for sexual or monetary purposes, including, but not limited to, the distribution and retention of child pornography or engaging a child in labor that is mentally, physically, socially, or morally dangerous or harmful, or interferes with their schooling.

(c) **Child Protection** is defined as all reasonable measures taken to protect children from child abuse.

(d) **Employee** means an individual hired by the Peace Corps, whether full-time or part-time, permanent or temporary, and includes individuals performing duties as experts, consultants, and personal services contractors.

(e) **Volunteer** means any Peace Corps Volunteer or Trainee.

4.0 Policy

(a) All employees while working with children in the course of their official duties and all Volunteers must adhere to the Child Protection Code of Conduct set out in Attachment A.

(b) In order to identify individuals who may pose a risk to child safety, Peace Corps will conduct a background investigation in the selection of employees and Volunteers.

(c) Peace Corps will incorporate the principles of its child protection policy into its regular training for employees and Volunteers.

(d) Employees and Volunteers must bring to the attention of the Peace Corps any suspected child abuse by any employee or Volunteer.

(e) Failure to comply with this Manual Section may result in disciplinary action, up to and including termination of Peace Corps service or employment. An employee or Volunteer found to have violated this policy may also be subject to host country and U.S. prosecution.

5.0 How to Report Violations

Employees and Volunteers may report allegations of violations of this Manual Section to the Country Director or other senior staff at post, or the appropriate Regional Director, the Associate Director for Safety and Security, the Associate Director for Global Operations, the Office of Inspector General, or other appropriate offices at Headquarters. Volunteers may confidentially make such reports under the provisions of MS 271 *Confidentiality Protection*. For information on reporting violations of this Manual Section to the Office of Inspector General, see MS 861 *Office of Inspector General*.

6.0 Roles and Responsibilities

6.1 Country Directors

Country Directors are responsible for:

(a) Ensuring that employees and Volunteers receive appropriate training on child protection issues and on their obligations under this Manual Section.

(b) Responding in a timely manner to child abuse reports or allegations committed by employees and Volunteers.

(c) Considering child protection issues and policies in making appropriate site placements and developing relationships with other organizations and agencies.

6.2 Office of Human Resource Management

The Office of Human Resource Management is responsible for:

(a) Ensuring that new Headquarters and Regional Recruiting Offices employees receive appropriate training on MS 648 *Child Protection* and on their obligations under this Manual Section.

(b) Providing notification to current Headquarters and Regional Recruiting Offices employees about their obligations under this Manual Section.

6.3 Office of Volunteer Recruitment and Selection

The Office of Volunteer Recruitment and Selection is responsible for the screening of applicants for Volunteer service in order to identify individuals who have a documented record of child abuse.

6.4 Office of Safety and Security

The Office of Safety and Security is responsible for implementing the screening protocols of potential employees in order to identify individuals who have a documented record of child abuse.

6.5 Office of Overseas Programming and Training Support

The Office of Overseas Programming and Training Support is responsible for ensuring that overseas U.S. direct hires receive appropriate training on child protection issues and on their obligations under this Manual Section during Overseas Staff Training (OST).

7.0 Procedures

Any necessary procedures implementing this Manual Section must be approved by the Office of Global Operations, the Office of Safety and Security, the Office of Volunteer Recruitment and Selection, the Office of Human Resource Management, and the Office of the General Counsel.

8.0 Effective Date

The Effective Date is the date of issuance.

Attachment A to MS 648

Child Protection Code of Conduct

In the course of an employee's or Volunteer's association with the Peace Corps:

Acceptable Conduct

At minimum, the employee or Volunteer will:

(a) Treat every child with respect and dignity.

(b) When possible, work in a visible space and avoid being alone with a child.

(c) Be accountable for maintaining appropriate responses to children's behavior, even if a child behaves in a sexually inappropriate manner.

(d) Promptly report any concern or allegation of child abuse by an employee or Volunteer.

Unacceptable Conduct

And, at minimum, the employee or Volunteer will not:

(a) Hire a child for domestic or other labor which is culturally inappropriate or inappropriate given the child's age or developmental stage, or which significantly interferes with the child's time available for education and recreational activities or which places the child at significant risk of injury.

(b) Practice corporal punishment against, or physically assault, any child.

(c) Emotionally abuse a child.

(d) Develop a sexual or romantic relationship with a child.

(e) Touch, hold, kiss, or hug a child in an inappropriate or culturally insensitive way.

(f) Use language that is offensive, or abusive towards or around a child.

(g) Behave in a sexually provocative or threatening way in the presence of a child.

(h) Perform tasks for a child that the child is able to do for himself or herself that involves physical contact, including changing the child's clothing or cleaning the child's private parts.

(i) Access, create, or distribute photos, videos, or other visual material of a sexual and abusive nature to or involving a child.

Overseas Programming and Training Support

The Peace Corps Office of Overseas Programming and Training Support (OPATS) develops technical resources to benefit Volunteers, their co-workers, and the larger development community.

This publication was produced by the Peace Corps with funding from the Feed the Future program through the U.S. Agency for International Development (USAID) Bureau for Food Security. It is distributed through the Knowledge and Learning Unit within the Peace Corps Office of Overseas Programming and Training Support. The Peace Corps encourages the public to freely use this publication and other technical and training materials produced by the agency.

Volunteers are encouraged to submit original material to KLU@peacecorps.gov. Such material may be used in future training material, becoming part of the Peace Corps' larger contribution to development.

Peace Corps
Office of Overseas Programming and Training Support
Knowledge & Learning
1111 20th Street, NW, Sixth Floor
Washington, DC 20526

KLU@peacecorps.gov

Abridged Dewey Decimal Classification (DDC) Number: 372.357

The Peace Corps is committed to providing access and reasonable accommodations to individuals with disabilities. Should you require this material in an alternate format, please contact the Office of Civil Rights and Diversity at 202-692-2139 or ocrd@peacecorps.gov.