



Teacher Guide

A Backyard Activity Book for Kids



Welcome to the Teacher Guide for *Join Our Pest Patrol, a Backyard Activity Book for Kids*. While this introduction to integrated pest management (IPM) is written at an upper third grade level, it is adaptable and everyone can benefit from the concepts covered. These include:

- distinguishing weed and insect pests from beneficial plants and insects
- understanding why humans want to manage pests
- recognizing common pests in our homes, gardens, and neighborhoods
- choosing the least toxic ways to manage pests
- safeguarding against pesticide risks.

Whether the children you teach and live with are rural or urban, apartment dwellers or residents of homes or farms, the concepts will serve them. And for you, this Teacher Guide is packed with fast facts, investigations, activities, and resources to support children's curiosity and extend learning. They'll help you teach kids to *Join the Pest Patrol* with IPM—integrated pest management!

IPM: Safer Ways to Bug Pests

Every day, pests bite, bore, chew, and suck their way through our crops and gardens, belongings and homes—and sometimes us and our animals. Plant pests (weeds) grow where we don't want them.

Pests can be annoying and bothersome. They can be serious health hazards. Yet, many people are concerned that the pesticides we use to manage pests can cause problems, too. More people need to realize that it can also be a matter of making good decisions based on sound information and simple practices. How can pests be managed safely? How can they be kept below levels that cause economic damage? These are goals of IPM; the "integrated" part of IPM.

While the activity book doesn't introduce the term IPM until the last pages, basic understandings are woven throughout the activities. Adults using the book with children should know that rather than routinely applying pesticides, people who practice IPM decide upon a tolerable level of pests and use pesticides only when and where necessary by:

- gathering and studying information about the site, plants, potential pests, and problems
- using a combination of tactics to manage pests rather than relying on only pesticides.

- changing their practices and attitudes (such as mowing, fertilizing, or watering) to eliminate problems
- changing their attitudes by learning more about the desire for "perfect" fruits and vegetables, manicured landscapes, and wiping out all pests
- using biological controls against pests
- physically controlling small populations of some insect, disease, and weed pests through handpulling, barriers, traps, water sprays, and dry conditions.

Why IPM?

Public concerns about health and environmental risks associated with chemicals are increasing, particularly when children are involved. As we become more aware of the health and environmental risks pesticides may pose, our interest in equally effective alternative pest control methods grows.

Because it is in everyone's best interest to reduce exposure to potentially harmful chemicals. PA IPM promotes the use of IPM through education, technical or financial assistance, information and research. At the national level, the U.S. Environmental Protection Agency (EPA) states that administrators and other people who make pest control decisions for school buildings and grounds should become aware of the least toxic options available to them. IPM is in the schools, and you'll find contacts for IPM in Schools heading the Helpful Resources on page 4.

The PA IPM Program promotes the use of IPM in multiple environments.

PA Academic Standards for Environment and Ecology

Join Our Pest Patrol can help you address the PA Academic Standards for E & E. Students have opportunities for observing, predicting, inferring, and describing; finding patterns and relationships; designing or doing experiments; raising questions and seeking information; reading, writing, responding, and more. IPM is one of the specific learning objective in the E & E Standard. Each activity in this book has a number that corresponds to the IPM objective covered.

"A weed is a plant whose virtues have not yet been discovered."

Ralph Waldo Emerson



Fast Facts and Fun Activities

Dandelions

- Dandelions are not native to North America. Originally from Eurasia, they were brought to the New World by the Puritans for food and medicine.
- The dandelion's impressive survival skills, for which our ancestors were grateful, are now the main reason dandelions are despised by so many people.

Try This!

Inquiries for Young Scientists

1. Find out which of your relatives and neighbors have a lot of unwanted dandelions in their grass. Ask them how they manage dandelion growth, and how well their methods work. Design an experiment of your own to test these different methods of reducing dandelion growth. What's the most effective way to get rid of dandelions? Record findings.
2. Observe the life cycle of dandelions. When do they start to flower? When do they develop seeds? What insects pollinate them? How do they respond to weather conditions and amount of light or darkness? Describe how you could collect data to record and describe your observations.

Cockroaches

- Cockroaches are expert hitchhikers. They can crawl into your pant cuff while you're on a bus or into your lunch box while you're at school. If they live in your neighbors' apartments, they can soon crawl into yours. Cockroaches can move among apartments along water pipes or through air vents and cracks. Many hide in old furniture. Some come up through sewer pipes. Cockroaches or their eggs could be in a bag or box, on clothing, in furniture or merchandise that is purchased and carried into buildings.
- A combination of sanitation, building modification, application of insecticides, and diligence can manage these pests. Sanitation is the most important.

Try This!

Roach Tales for Young Writers

Cockroaches have been around for 300 million years, so they must be doing something right! Imagine you are a roach. Write a story telling about your adventures. Where do you want to live? Why? What do you eat? What bothers you? What narrow escapes have you had? What are you proud of?

Did You Know?

The National Institute of Allergy and Infectious Diseases (NIAID) reported a large study's conclusion that the combination of cockroach allergy and exposure to the insects is an important cause of asthma-related illness and hospitalization among children in U.S. inner-city areas. The study appeared in the May 8, 1997 issue of *The New England Journal of Medicine*.



Ticks

Help children understand what ticks look like, how ticks get on people, and where ticks live. Teach children how they can take simple steps to prevent tick bites and Lyme Disease.

- While feasting on their host, infected ticks can transmit pathogens. Lyme Disease, Rocky Mountain Spotted Fever, and Human Granulocytic Ehrlichiosis (a disease that weakens the immune system) are diseases transmitted by ticks.
- Lyme Disease is a bacterial infection transmitted to humans by the bites of infected black legged ticks (deer ticks). This illness may affect the skin, joints, nervous system, heart, and other areas of the body. People of all ages can get Lyme Disease. Early diagnosis and treatment can prevent the later symptoms, which may develop months or years after the tick bite. Anyone who has a rash, fever and chills, fatigue, headache, muscle or joint pain within 3 to 30 days after a tick bite should see a doctor.
- Why do you suppose the PA shaded counties on the map in the activity book are risk counties? The reasons are: host and habitat. The black legged tick needs high humidity, found in dense woodlands, so it doesn't thrive in the drier habitat. The preferred host of the young deer tick is the white-footed mouse, while adult ticks prefer deer as the host.

Mosquitoes

- Because of the diseases they spread, mosquitoes kill more people than any other animal. They can spread more than 100 viral diseases.
- Mosquitoes transmit dog and cat heartworm, a parasite that attacks the heart and major arteries of dogs and cats.
- Only females take blood; males feed on plant nectar.

Try This!

Mosquito Patrol!

Teach children to do all they can to reduce the standing water around their homes or schools. Also. . .

- Keep grass and shrubs trimmed around the house to eliminate shady hiding places for mosquitoes.
- Use sand to fill in any holes in trees or hollow stumps that hold water.
- Empty wading pools. Store indoors when not in use.
- Keep drains and ditches unclogged so water will drain.
- Cover trash containers.

Bees and Wasps

- Swatting at a bee is interpreted by the bee as an act of aggression. Watch out!
- Bee stingers are wonders of nature. After a bee stings and deposits its stinger, the stinger continues to pump venom into your bloodstream for up to 20 minutes. The venom even contains a chemical that makes other bees in the area more aggressive and prone to sting. It's better to avoid getting stung in the first place.

- To remove the stinger, gently scrape the small dark spot in the raised red area until the stinger pops out. If someone has been stung many times, first look for stings on the head, neck, and torso. The big danger is anaphylaxis, a life-threatening type of allergic reaction.

Earthworms

Earthworms have an important job to do. They break down pieces of fallen leaves and thus provide food for plants. They also give plant roots more air to breathe and water because worm tunnels let air and water enter more deeply into the soil.

But wait! Can there be “too much of a good thing?”

Alien worms?! Find out at http://www.smithsonianmag.si.edu/smithsonian/issues00/aug00/phenom_aug00.html

Try This!

Wormy Workings for Curious Kids

- Challenge children to come up with ways to test these facts about worms:
 - A worm has a top side and a belly side.
 - Worms cannot see, but will move away from light. How does this protect them? (NOTE: Tell children that worms do not move away from red light. How could hunters of fish bait use this to their advantage?)
 - When a worm moves, the worm’s head end usually goes first.
- What happens to earthworms in winter? Visit this Journey North web site to find out: <http://www.learner.org/jnorth/fall1999/jsouth/Update102299.html>

Plan for Pesticide Safety

When it comes to pesticides, what we don’t know can hurt us. Parents may share their children’s lack of awareness about the potential dangers of household and garden chemicals. Because children cannot be completely protected from exposure, they must be educated about pesticide safety.

Discuss that children should never use pesticides. All pesticides should be locked up. Children may accidentally come in contact with a pesticide; follow the safety instructions on the container, if this occurs.

Did You Know?

A new U.S. Environmental Protection Agency study shows that small children are exposed to pesticides from “track-in” on pet paws or shoes that get contaminated with the chemicals from lawns and gardens. The study showed that people and pets can pick up pesticides such as those used on lawns, for up to a week after application. Toddlers, because they tend to spend a lot of time on the floor, are at highest risk of exposure. Conducted by the Battelle Memorial Institute in Columbus, Ohio, the study was reported in the May 2000 issue of *Environmental Science & Technology*.

Try This!

Thinking and Decision Making for Young Citizens

Play “What if. . .” to help children identify what they can do in case they come into contact with pesticides. These examples will spark more of your own:

- What if the lawn chemical truck drives up and starts spraying your neighbor’s lawn when you are out playing? (*Children should go inside, along with their toys and any pets or pet toys, and stay away from the area until chemicals are dry and a parent says it is safe.*)
- What if your baby brother crawls into the bathroom when the floor is still wet from washing with disinfectant, then sucks on his fingers? (*Go tell an adult right away. The adult can wash the baby and close off the bathroom until the floor is dry.*)
- What if you picked a plum from a tree that was just sprayed with insecticide? The plum was wet and you wiped your hands on your jeans. (*Go tell a parent or other adult right away. Contaminated clothing should be removed and washed by a parent, and the skin should be carefully washed with soap and water.*) Wash all fruits before eating.

Looking Ahead

When properly used, pesticides are of great benefit to people. But too much use or improper use of them has raised environmental concerns. By killing non-target species, pesticides may disrupt habitats by destroying parasites and predators. This allows other organisms that were kept in check by these beneficial insects to multiply and become pests. Pest populations sometimes become resistant to pesticides. Pesticide residues that remain on foodstuffs may pose a danger to humans and animals. Weed and insect killers can make their way through the soil and end up in our groundwater, or move through the food chain to harm fish and birds.

Attitudes about pest control are changing. Joining the arsenal to fight pests are biological controls and integrated pest management (IPM). Won’t you and your students *Join Our Pest Patrol?*

DEET WARNING

The American Academy of Pediatrics advises against using products containing DEET on children. The Environmental Protection Agency recently called for the removal of “safe for children” from the labels of products containing DEET. DEET can be absorbed by the skin and cause health problems such as dizziness, weakness, and, very rarely, seizures and death. Use caution and common sense when applying insect repellent to children.

“When we try to pick out anything by itself, we find it hitched to everything else in the universe.”

John Muir



Helpful Resources

IPM Contacts for Pennsylvania

Edwin Rajotte, IPM Coordinator
Penn State University
501 ASI Building
University Park, PA 16802
Phone: 814-863-4641
e-mail: egrajotte@psu.edu

Lee Bentz, IPM Coordinator
Pennsylvania Department of Agriculture
Room G11, Ag Building
2301 N. Cameron St.
Harrisburg, PA 17110
Phone: 717-772-5204
e-mail: lbentz@state.pa.us

Agencies and Web Sites

The Pennsylvania Integrated Pest Management Program
<http://paipm.cas.psu.edu>

The Pennsylvania Department of Agriculture
<http://www.pda.state.pa.us>

The Pennsylvania Department of Education
<http://www.pde.state.pa.us>

The Pennsylvania Department of Health
<http://www.health.state.pa.us>

The Pennsylvania Department of Conservation and Natural Resources
<http://www.dcnr.state.pa.us>

The Pennsylvania Department of Environmental Protection
<http://www.dep.state.pa.us>

The Pennsylvania Center for Environmental Education
<http://www.pcee.state.pa.us>

The Pennsylvania Alliance for Environmental Education
<http://www.pae.e.state.pa.us>

Free Publications

Citizen's Guide to Pest Control and Pesticide Safety (EPA 730-K-95-001), *Pest Control in the School Environment: Adopting Integrated Pest Management* (EPA 735-F-93-012), and *Help! It's a Roach! A Roach Prevention Activity Book for Kids* (EPA 735-F-98-016) produced by the Environmental Protection Agency (EPA) and provided at no cost to teachers by the EPA National Center for Environmental Publications and Information. Call 1-800-490-9198 and provide the title and EPA publication number.

Backyard Conservation, 28-page booklet by the USDA Natural Resources Conservation Service, the Wildlife Habitat Council, and the national Association of Conservation Districts. Call 1-888-LAND-CARE for your free copy.

Especially for Educators

Pests Have Enemies Too: Teaching Young Scientists About Biological Control (Grades 5-10)
Illinois Natural History Survey
607 East Peabody Drive
Champaign, IL 61820
(217) 333-6880

Cycling Back to Nature, Food Production and Pesticides (Grades K-12)
National 4-H Council
<http://www.fourhcouncil.edu>
(301) 961-2934

Insectaganza of Excitement! (Grades 3-12)
University of Minnesota, 4-H Cooperative Curriculum System
(612) 625-8173

IPM for Pennsylvania Schools: A How-to Manual
<http://paipm.cas.psu.edu> or <http://www.pde.state.pa.us>
(814) 865-6713

Books and Other Publications

Common-Sense Pest Control, Least-toxic solutions for your home, garden, pets and community
by William Olkowski, Sheila Daar and Helga Olkowski
(Taunton Books & Videos, 1991)

Weeds of the Northeast by Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso (Cornell University, 1997)

Landscaping with Native Plants in Pennsylvania and Invasive Plants in Pennsylvania (brochures)
[#Ecological](http://www.dcnr.state.pa.us/pubsforestry.htm)
(717) 787-3444

Literature for Children

Dandelions by Kathleen Kudlinski (Lerner Publications, 1999)

Dandelion Adventure by L. Patricia Kite (Millbrook Press, 1988)

Old Black Fly by Jim Aylesworth (Henry Holt and Company, Inc., 1992)

Please Don't Step on Me by Elly-Kree George (Cherokee Publications, 1981)

The Grouchy Ladybug by Eric Carle (Harper Collins, 1977)

The Very Quiet Cricket by Eric Carle (Philomel Books, 1990)

The Icky Bug Alphabet Book by Jerry Pallotta (Charlesbridge Publishing, 1986)

Why Mosquitoes Buzz in People's Ears: A West African Tale Retold by Verna Aardema (Dial Press, 1975)

