

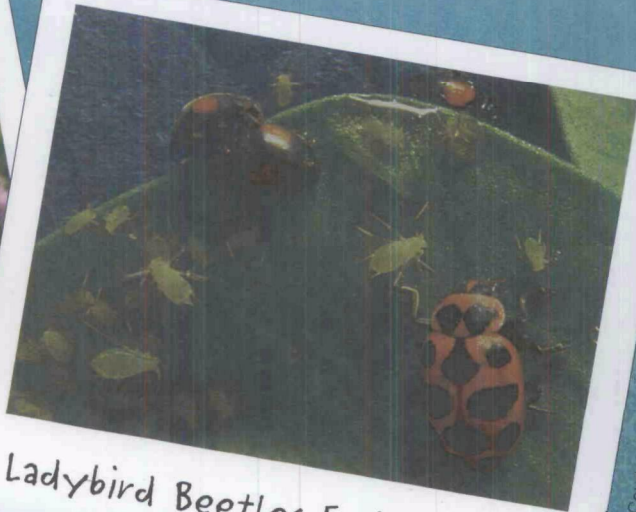
# Join Our **Pest Patrol!**

**A Backyard  
Activity Book  
for Kids  
On Integrated Pest  
Management**

Photo Courtesy Minnesota Department of Transportation



Purple Loosestrife



Ladybird Beetles Eating Aphids

Photo Courtesy U.S. Department of Agriculture

**H**ave you ever been bitten by a flea or mosquito? Treated your dog for fleas? Had head lice? Been stung by a wasp or bee? Watched weeds overtake your garden? Fought to keep cockroaches out of your school building?

We've all been bugged at one time or another by pests. For many of us, our first reaction is to reach for the nearest can of bug spray. But, pesticides and fertilizers that run off from lawns and other locations are a significant source of pollution in our environment. There's a better way to solve pest problems called Integrated Pest Management (IPM). IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of common sense practices. Teaching IPM at the grade school level can provide children with important information about pest identity and biology, and ecology. It can also help children understand the impact that personal choices—like whether or not to use chemicals to control pests—can have on our environment.

*Join Our Pest Patrol: A Backyard Activity Book on Integrated Pest Management*, originally developed by the Minnesota Department of Agriculture, is for educators of children in grades 1–6. *Join Our Pest Patrol* is chock full of fun activities that can easily be incorporated into reading, science, and even math and art classes. The activities are written for the 3–5 grade level, but can be easily adapted for the lower or upper grades. Each activity includes fun facts in "Did You Know," and "Tips for Grown-ups." There are also lots of links to interesting web sites that allow educators to expand their students' learning. Answers to all quizzes are located at the end of the book inside the back cover. We've also included a Web Resources List on pages 26 and 27 of all the web links identified in the activities for easier reference.

We hope you enjoy *Join Our Pest Patrol* and invite you to tell us about how you've used this resource by completing our Customer Feedback Form on page 29. Good luck, and thanks for your interest in Integrated Pest Management!

EPA thanks the following people who contributed to the activity book:

## Acknowledgments

### **MDA Project Team**

Jeanne Ciborowski, IPM Coordinator, Minnesota Department of Agriculture (MDA); Rick Hansen, Unit Supervisor, Agronomy and Plant Protection Division; Al Withers, Program Director, Minnesota Agriculture in the Classroom

### **Cooperators**

Bob Mugaas, Extension Educator, University of Minnesota Extension Service, Hennepin County; Jeff Ledermann, Education Specialist, Minnesota Office of Environmental Assistance; Julianne Jackels, Grade 3 Teacher, Oak Ridge Elementary, Eagan, MN

### **Writing/Editing**

Kathy Seikel, Jane Duden and Jan Hoppe

### **Design, Illustration, and Production**

Northern Design Group

### **U.S. EPA Project Coordinator**

Katherine Seikel, Office of Pesticide Programs, Communication Services Branch

Adapted for nationwide audience by Abt Associates, Inc., and The CDM Group, Inc., under contract with the U.S. EPA.

### **United States Environmental Protection Agency**

Office of Pesticide Programs  
Field and External Affairs Division  
Communication Services Branch  
1200 Pennsylvania Avenue, N.W. (7506P)  
Washington, D.C. 20460  
<http://www.epa.gov/pesticides/>  
(703) 305-5017

# Table of Contents

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Introduction and Acknowledgments .....	Inside front cover
Table of Contents .....	Pages i-ii
Activities .....	Pages 1-24
Insects: What's a Pest? .....	Page 1
A fill-in-the-blank activity that will help kids identify common pests. Also provides information about the beneficial behaviors of some pests.	
Insect Pests and Pals .....	Page 2
A bug crossword puzzle that will have your students eager to learn more about both the good and bad aspects of our insect friends.	
Fighting Pests with the 3 Ps .....	Page 3
Introduces the basics of fighting pests.	
What's a Weed? .....	Page 4
Describes both the good and bad about weeds, such as poison ivy and milkweed.	
Dandy...or Not? .....	Page 5
Presents information about dandelions, including neat ways to use them, and how to control them.	
Green, Green Grass .....	Page 6
Teaches kids when it's best to fertilize lawns and how to keep weeds from invading.	
The Right Plants in the Right Places .....	Page 7
Explains how plants thrive under the right conditions. Includes an outdoor component.	
Purple Plague! America's Most Wanted .....	Pages 8-9
This two-part activity includes information about Purple Loosestrife, one of America's most persistent and aggressive invasive species.	
Outsmart Those Pests! .....	Page 10
This activity helps kids learn cool ways to keep pests from invading their homes and gardens.	
Keep Pests from Pestering You Inside and Outside Your House! .....	Page 11
Teaches kids how to avoid being bitten by ticks and mosquitoes.	
Midnight Raiders: Cockroach Invaders .....	Page 12
This puzzle teaches kids about what roaches love to eat. Kids learn simple steps that they can take to eliminate roaches.	
Ticked Off! .....	Page 13
Provides fun facts about ticks, as well as information about where they live, how they feed, and what kids can do to avoid tick bites.	





# Table of Contents (continued)

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Join the Tree Hole Mosquito Patrol! .....	Page 14
Includes cool facts about mosquitoes, as well as information about where they live and what kids can do to eliminate their breeding grounds and to avoid getting bitten.	
Mosquito-Eating Machines .....	Page 15
Presents information about bats, their role in controlling mosquitoes, and how kids can build bat houses.	
Pests Have Enemies, Too! Aphids and Ladybugs .....	Page 16
Explains how aphids damage plants and how ladybugs can be used to eliminate aphids.	
What's All the Buzz? .....	Page 17
Shows kids how to tell the difference between bees and wasps and how to avoid being stung.	
Monster Caterpillar .....	Page 18
After completing this word scramble, kids will understand the life cycle of the gypsy moth, America's number one tree pest, and the various tree species it likes to eat.	
Wise up to Worms .....	Page 19
Teaches kids about the importance of earth worms to soil health and the various parts of these fascinating creatures.	
Crazy about Compost .....	Page 20
This activity teaches kids why compost is important, and how to make and use it.	
Don't Miss Mulch .....	Page 21
Includes a neat outdoor activity on mulch.	
The Web of Life .....	Page 22
Gives instructions to help kids draw one of the creatures they have learned about in this activity book.	
Plan for Pesticide Safety! .....	Page 23
Explains the dangers of pesticides and how kids can avoid being exposed to them.	
Are you Qualified for Pest Patrol? .....	Page 24
This quiz will test your student's knowledge of the concepts presented in this activity book.	
Glossary .....	Page 25
Web Resources List .....	Pages 26-27
Customer Feedback Form .....	Page 29
Answers .....	Inside back cover



# Insects: What's a Pest?

The world has more insects than all other living things combined. We need insects! Many insects work for us. They visit flowers and spread pollen so plants can produce fruits and vegetables. Some insects eat other insects that damage plants. These "worker" insects are welcome **guests**.

All insects have a place in the web of life. However some insects are a nuisance and some can be harmful. We call insects **pests** when they hurt, damage, destroy, or make us or our animals sick.

Gnats are an important food source for birds and frogs. Those animals don't think of gnats as pests at all.

Look for spider webs. Count the insects. You'll know spiders are at work!

Insects destroy 10-15% of the world's food each year.

Did You know?

## Pests or Guests

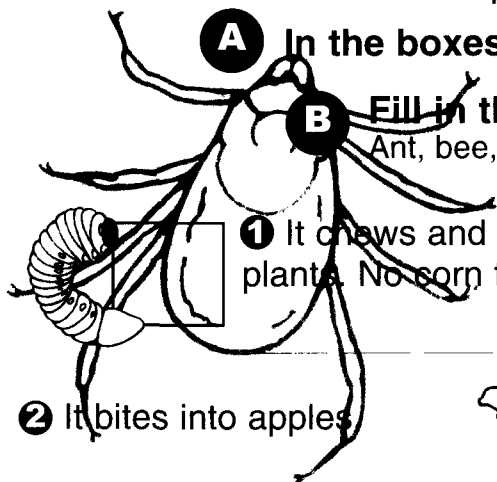


When are insects pests? And when are they welcome guests?

**A** In the boxes mark **P** for pest or **G** for guest.

**B** Fill in the blanks below.

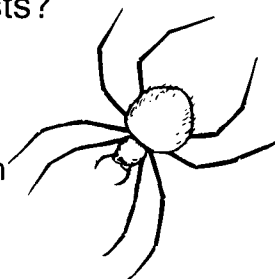
Ant, bee, cockroach, grub, mosquito, spider, wasp, worm



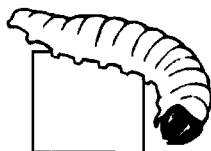
1 It chews and kills corn plants. No corn for us!

☐

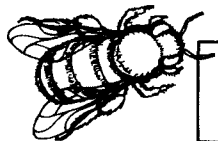
5 It preys on other insects that may harm plants.



2 It bites into apples.



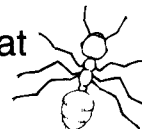
6 Its bite can give your dog or cat heartworm disease.

☐

☐

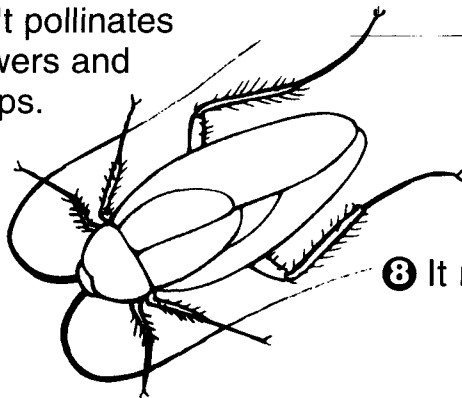
3 It pollinates flowers and crops.

☐

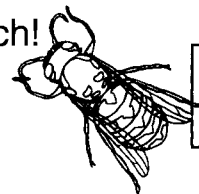
7 It shows up at your picnic.


☐

4 It can trigger an asthma attack.



8 It may sting. Ouch!


☐

This book shows some ways to fight the pests with least harm to the earth and other creatures.



# Insect Pests and Pals

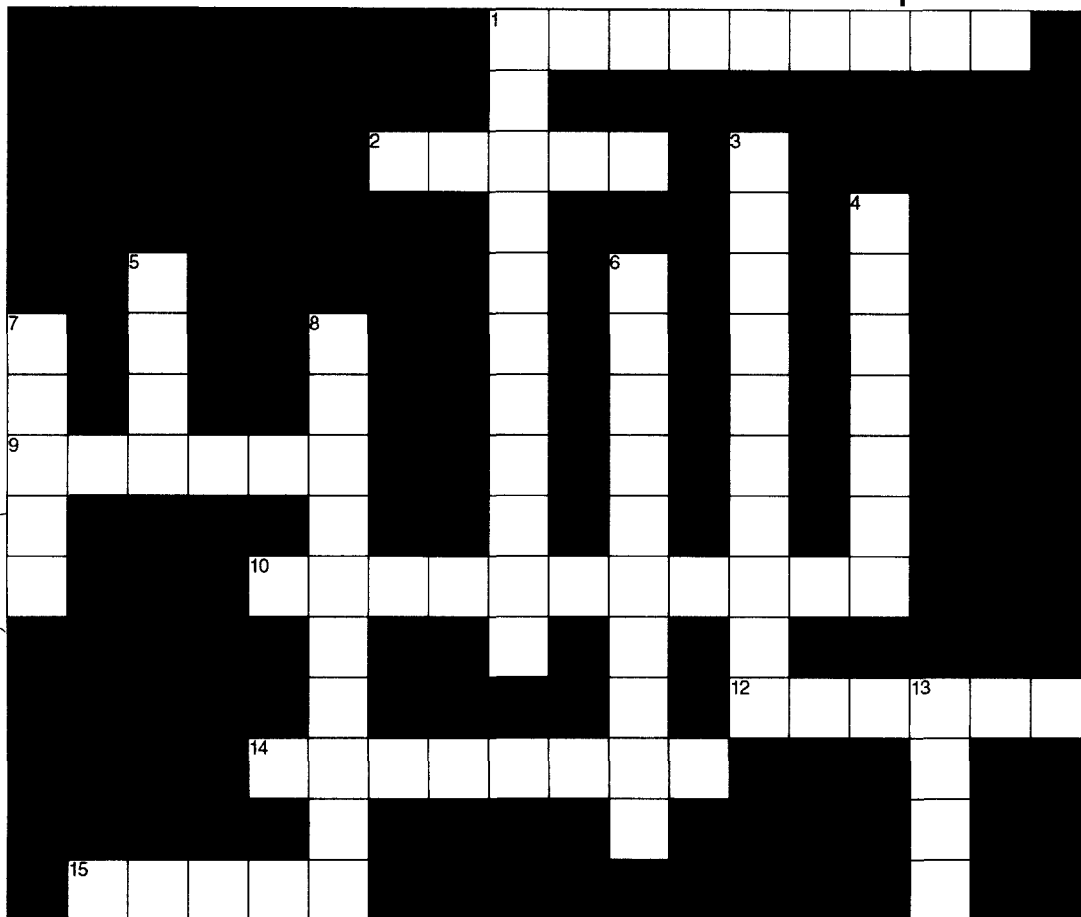
Some bugs help us. Some bugs pester us. All bugs are part of the web of life. If you think all bugs belong in bug zappers, think again!

Use words from the word bank below to do this puzzle.



What's the only insect that makes food humans eat?

See puzzle No. 13!



## Word Bank

- Aphids
- Bees
- Boxelder
- Butterflies
- Carpenter
- Cockroaches
- Fruitflies
- Gnats
- Houseflies
- Mosquitoes
- Moth
- Spiders
- Sowbug
- Ticks
- Wasps

### Across:

1. Large black ant that nests in wood.
2. They get on you to suck your blood.
9. They harm plants by sucking sap.
10. Beautiful insects that drink nectar.
12. Outdoor creepy-crawly that eats rotten plant matter.
14. Red and black bugs that eat tree leaves and seeds but don't kill trees.
15. They sting, but also kill harmful insects.

### Down:

1. They eat almost anything, they like the dark, and they are hard to get rid of.
3. Tiny, flying insects that breed in fruits and vegetables.
4. They have eight legs and eat insects.
5. It eats holes in wool and fur clothing.
6. They spread germs with their feet. Frogs eat them.
7. Small, flying bugs. The female's bite is itchy.
8. They give itchy bites. Bats eat them.
13. They sting, but also make food that humans eat.

What's the difference between a coyote and a flea?



A coyote howls on the prairie. A flea prowls on the hairy.





# Fighting Pests with the 3 Ps

Many scientists are trying to find ways to fight pests. One way is to use pests of pests, or the three Ps!

**Predators** hunt and kill pests for food.

**Parasites** live on or inside pests and also may kill them.

**Pathogens** cause disease in pests. Pathogens are germs like bacteria or viruses.

## The 3 Ps in Action

In the examples below, which of the 3 Ps is fighting pests?

**1** Bugs are attacking the plants in your school playground. Upon close inspection, you find tiny insects called scales on plant leaves. Insect killers (insecticides) would kill the scales, but might also harm other creatures in the playground. Also, school officials do not want to use insecticides where kids play. School officials work with agricultural extension agents to put tiny stingless wasps to work. These wasps lay their eggs inside the pesty scales. Wasp larvae hatch and grow inside the scales. That kills the scales.



P \_\_\_\_\_

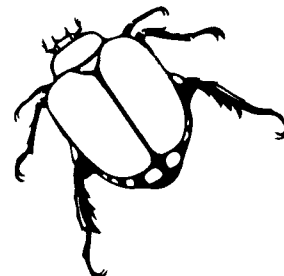
**3** The brown bat can catch 1,200 mosquito-sized insects in just one hour.



P \_\_\_\_\_

**2** Japanese beetles have invaded America. They eat roots, leaves, flower buds and fruit.

They can kill bushes, trees, grasses, and garden and field crops. Now a germ is on the job. It causes a disease that kills the Japanese beetle.



P \_\_\_\_\_

**Try This!**

Imagine you are one of the 3 Ps.

**Make a poster to advertise yourself.**

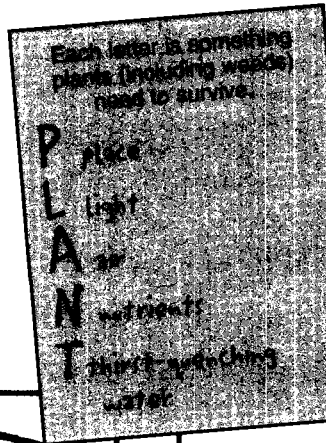


# What's a Weed?

**A** weed is a plant growing where you don't want it. Weeds steal sunlight, growing space, and moisture from grass and plants we do want.

Weeds spread by seeds.  
Pull weeds before they set seeds. Then you'll have fewer weeds in the future!

"Seeds one year,  
weeds for seven."



## Least TOXIC Tips

### Take a whack at weeds!

- Pull or hoe weeds out. Be sure to get every tiny bit of root so the weed doesn't grow back.
- The best time to get rid of weeds is when they are small.
- Weeds pull more easily from moist soil.

COLOR THIS



Poison ivy is a pest when it grows where we hike or play. It gives you an itchy rash and weepy blisters. Is poison ivy good for anything?

Some animals and birds eat the leaves and berries.

Bees sip nectar from the flowers.

## Who Needs Weeds?



Milkweed can be a pest when it grows in fields of crops. But what would happen if it disappeared? Monarch caterpillars eat milkweed. Without milkweed, what would happen to monarchs?

Monarch butterflies taste bad to birds because when they were caterpillars they ate milkweed.

Did You Know?



# Dandy... or not?

Many people think dandelions make lawns ugly. Dandelions crowd out grass and can damage sidewalks and pavements. But people long ago thought dandelions were dandy. They used them for medicines. They made fried **flower** blossoms and leafy salads. They boiled and fried **roots** and made roasted root tea. Some people still do!



Color the dandelion. In the blanks, write the name of the plant part and possible uses for the part.

## Dig THIS!

What can you do with dandelions?

- Make a bouquet.
- Make a dandelion chain. Pick several dandelions with long stems. Make a small slit in the dandelion stems. Poke the end of the **stem** from one dandelion through the slit on another dandelion. Repeat until you have a chain of dandelions.
- Tie-dye a t-shirt! The dandelion's yellow **flowers**, green **leaves**, and red **roots** can be used to make colorful dyes.



Do you think dandelions are pests?

Yes

No

☐
☐

Dandelion flowers provide pollen and nectar for insects.

One dandelion flower can produce over 300 dandelion seeds! Birds eat the seeds.



## Tip

Want to get rid of dandelions?

Pull them out while they still have yellow flowers—**BEFORE** they can spread seeds.

Dandelion seeds are carried by the wind. They travel like tiny parachutes. A strong wind can carry a seed miles away from the parent plant (Science Museum of Minnesota). For more information go to <http://www.smm.org/sln/tf/d/dandelion/dandelion.html>

Did You Know?



# Green, Green Grass

It's hard for crabgrass and weeds to take over healthy grass. Grass that is healthy should require few, if any, chemical weed and insect killers. What times of the year do people feed (fertilize) grass to keep it strong and healthy?

**A bear can help your family remember the right times to fertilize grass.**



In winter, a bear sleeps. It eats nothing.

Grass needs nothing.



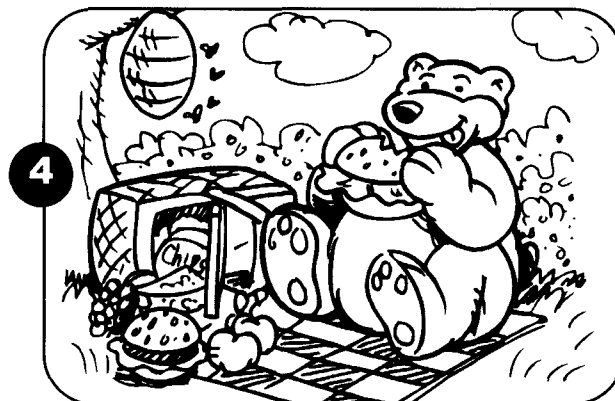
In spring, bears are hungry when they wake up. They need food.

Grass needs \_\_\_\_\_.



In summer, bears get what they need without extra help.

Grass needs \_\_\_\_\_.



In fall, a bear pigs out before it hibernates.

Grass needs \_\_\_\_\_.



**Dress each bear for the season.**



A healthy lawn always has some weeds and insects (helpful insects included).

# The Right Plants in the Right Places

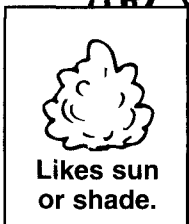
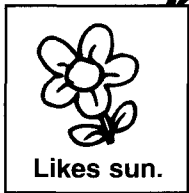
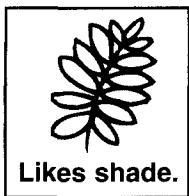
**Y**ou do best in a certain kind of habitat. So do plants! To grow and thrive, it's important to have the right conditions. Be a friend to plants. Notice where each grows best. Then let it grow there!

Walk around your lawn, schoolyard, or neighborhood park. Notice where different plants grow well. What is it like? Is it wet or dry? Shady or sunny? Are there places where nothing grows?

Use what you learned on your walk. Draw ferns, cattails, flowers, and other plants where each would grow best.

**Make a path from the cabin to the lake.  
Put the right plants in the right places.**

Plants growing in their own best habitat are the best survivors.

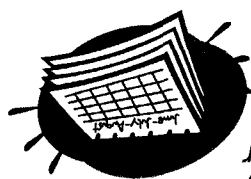


# Purple Plague!

# America's Most WANTED

**P**urple loosestrife is pretty—and pretty dangerous. Why? This weed hogs the land and crowds out native plants and wildlife. It causes trouble when it grows in wetlands. The stems and roots are so tough that boats and wildlife can't get through. Other plant life can't survive where purple loosestrife takes over. Then wetland animals lose their food and shelter.

When purple loosestrife was brought to North America, its natural enemies were left behind. With nothing to stop it, the plants spread like wildfire. Now something's bugging purple loosestrife. Experts brought natural insect enemies from Europe to eat the plants. These beetles can slow purple loosestrife's spread.



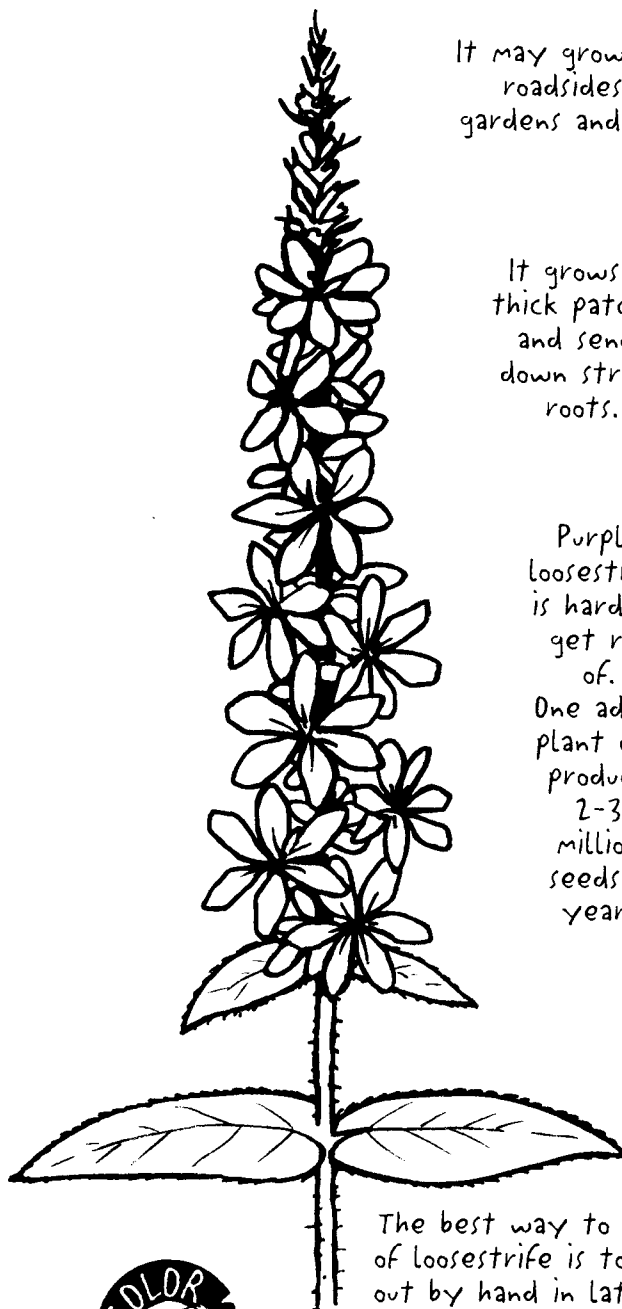
People have increased the spread of purple loosestrife by planting it in gardens and by using it as a pollen source for honey bees. Have you seen purple loosestrife in a garden near you?

**Did you know?**

It may grow along roadsides, in gardens and parks.

It grows in thick patches and sends down strong roots.

Purple loosestrife is hard to get rid of. One adult plant can produce 2-3 million seeds a year!



The best way to get rid of loosestrife is to pull it out by hand in late June, July, and early August, before the plant has gone to seed.

Unscramble the words to see the only states where purple loosestrife does NOT grow!

**O R A D F I L**

**A W I I H A**





## Tips

### Stop Purple Loosestrife!

- If you see purple loosestrife, pull it up right away. Put the plant pieces in plastic bags.
- Tell others about purple loosestrife. It destroys native plants, animals, and wetlands.
- Read labels before you buy any seed packages. You'll find purple loosestrife seeds in some wildflower seed mixes. Don't buy them!

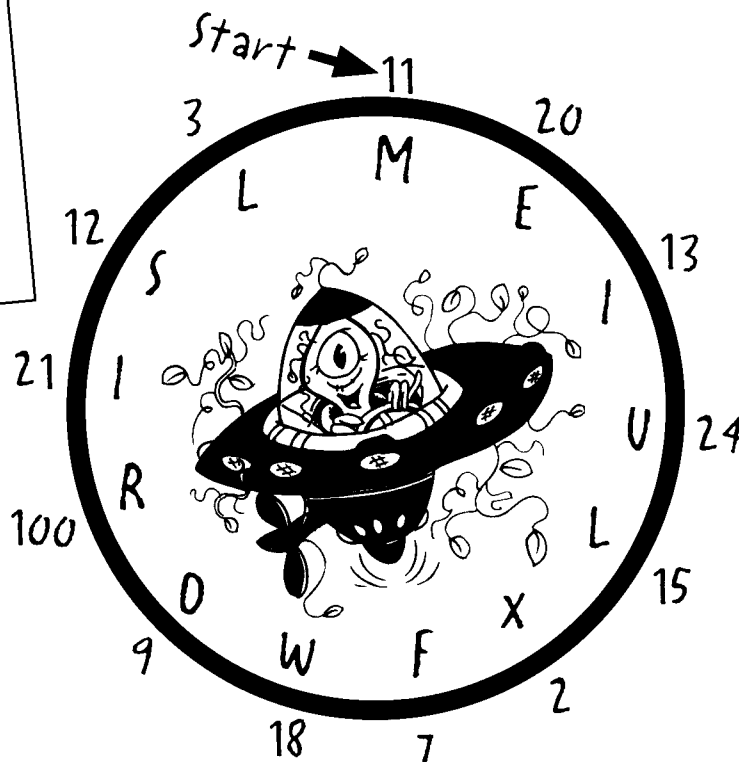
Check  
boats  
for  
milfoil!



# BEWARE

Another alien weed has invaded America.  
This weed

- clogs rivers and lakes,
- crowds out native plants,
- grows into mats so thick that boats and swimmers can't get through, and
- destroys food and habitat for our fish and water birds.



Circle the letters by the odd numbers.  
You'll spell the name of this weed!

\_\_\_\_\_

Date: \_\_\_\_\_  
Feet \_\_\_\_\_  
Inches \_\_\_\_\_

With moist soil and full sun,  
purple loosestrife can grow up to  
10 feet tall. How tall are YOU?

Did  
You know?



# Outsmart those pests!



1

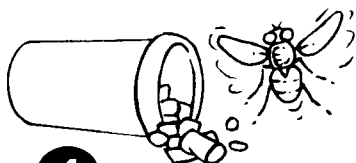
Put up \_\_\_\_\_  
 Plant \_\_\_\_\_

and plants with berries. These attract birds to feast on insects that harm plants.

2



Welcome \_\_\_\_\_  
 They eat \_\_\_\_\_  
 that eat and damage plants.



4

Take

\_\_\_\_\_ and recycling outdoors.

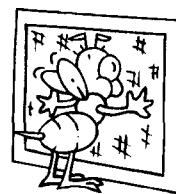
3

Clean up

\_\_\_\_\_ Wipe up spills. Keep rooms clean.

5

Put \_\_\_\_\_ on doors and windows. Keep insects out!



6

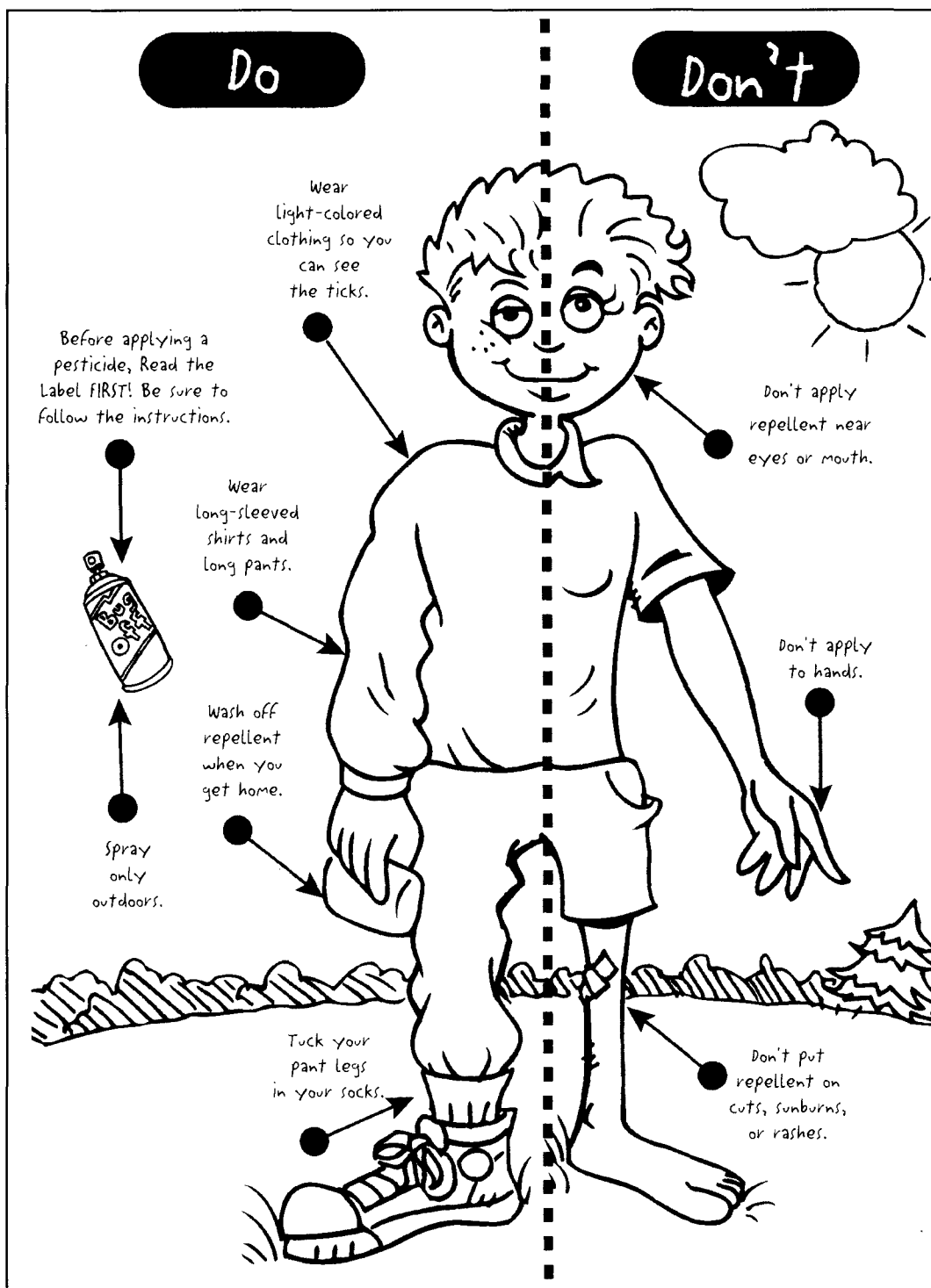
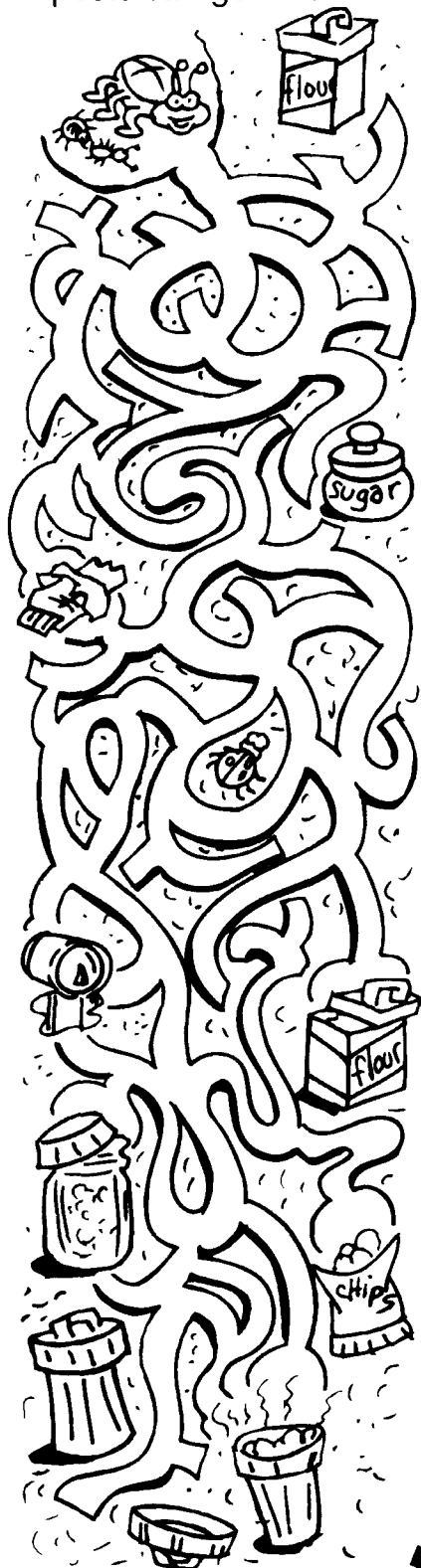
Stake up

\_\_\_\_\_ to keep their leaves off the ground. Water them with a can or bucket, not a spray. Then spores that live in the soil won't splash up on the plants and make them sick.



# Keep Pests from Pestering You Inside and Outside Your House!

Kitchen pests like cereal, flour, oatmeal, crackers, and pancake mix. Travel the maze to see which containers pests can get into.



# Midnight Raiders: Cockroach Invaders

Cockroaches love living with people. Homes give them lots of food and cozy spaces to rest and breed. But no one wants cockroaches in their home. They smell bad. They run all over at night. They can cause allergies, too.

To get rid of roaches, think like a roach. What would make you leave a cozy human home?

See the Roach Prevention Activity Web Site for Kids at  
<http://www.epa.gov/pesticides/kids/roaches/english/>



## Leaky TOXIC Tips

Get Rid of Roaches

### Check things to do:

- Fix leaky pipes and faucets. (Cockroaches need water.)
- Take out the garbage every day.
- Keep food in closed containers.
- Don't leave dirty dishes in the sink overnight.
- Wash food from cans before recycling.
- Plug up cracks and holes. Young roaches can squeeze through a crack as thin as a dime.
- Clear out warm, dark places so roaches can't hide.

## Cockroach Menu

What's yummy to a roach? Search for the hidden words to find out. Then make sure the roaches won't get to these goodies in your home!

V R N U J Y Q S P C G D J H H J R Z T  
F I N G E R N A I L C L I P P I N G S  
P M B T S J H W G U G D U Y D R R I Y  
Z G E V K B S T D I K I G Z O G V B O  
C Z S G V O O P I Q V P Z I C R G A W  
Q W X L V S D O E C L E H R W E E M W  
H T H U B E D E K A B V Y W I A C I G  
Y A G E I Q Z Y J B N H O M P S R K L  
U X U O W I Q V L I I U L D L E S M C  
S R E N A C S O A P M N T I F I K U C  
Q C X N D F Y T C K X Z D B L M P N R  
U L L P S C W K H X Q U H I U G C H U  
O S P O L X O B C Y U O J W N T X Q M  
U W P E U V W M G F N N W E C G T K B  
Z H U A P E T F O O D P F M L F S E S  
P Q D O R M M Y D B A Z X F R H P Y R

**Word Bank:** peanut butter; fingernail clippings; crumbs; pet food; glue; bookbindings; grease; soap

- Roaches scatter faster than you can blink your eye. Their waxy coat lets them flatten, and they easily slip through tiny cracks and holes.
- Cockroaches can cause asthma in many kids. The skins cockroaches shed when they grow cause the allergies. These skins float around in homes.

**Did You Know?**

**Nasty!** When they eat, cockroaches barf a little bit. They also leave poop. These smelly things mark the spot so the roaches can find food later.

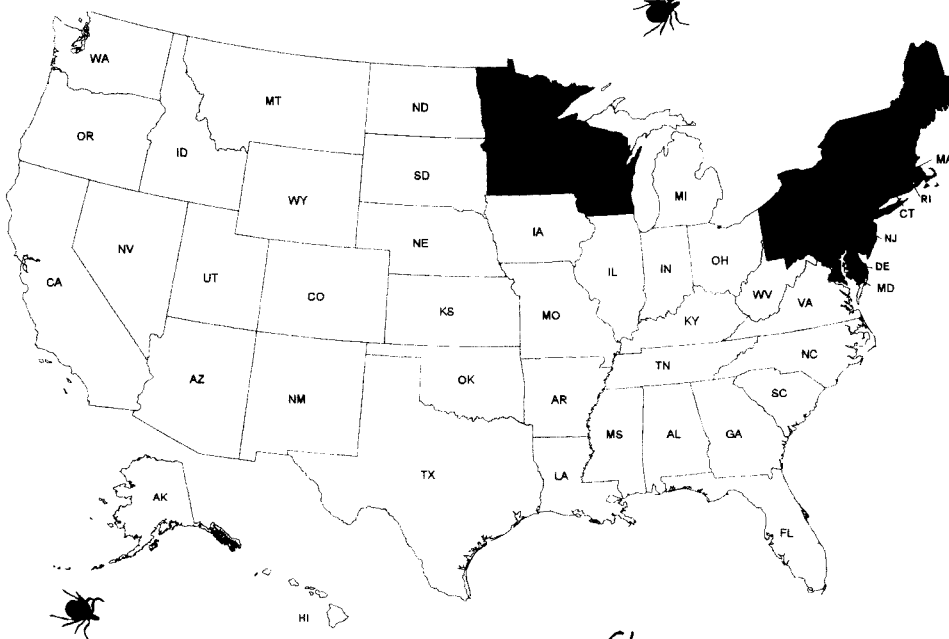
# Ticked OFF!

**T**icks are pests that live off blood. They find the blood in people and animals. While feasting on their host, ticks can pass along sicknesses like Lyme Disease.

Ticks wait for their food to come to them. Ticks can sense body heat and carbon dioxide—a gas people and animals breathe out—to find prey. When blood sources like humans brush against them, ticks hop on.

## Lck, a Tick!

Ticks can be found all over the United States. People living in the shaded states of the country have a higher risk of being bitten by ticks carrying the bacteria that causes Lyme Disease. **Mark an "X" on the state that YOU live in.**



Source: Centers for Disease Control and Prevention (<http://www.cdc.gov/health/>). Cited by the American Lyme Disease Foundation, Inc. ([www.aldf.com/](http://www.aldf.com/)).

*Check and protect your pets, too.*



When ticks attach, they place a barbed mouth-  
piece into your skin—NOT their head.

**Did you know?**

- Ticks live in the woods and tall grass.
- They only eat three times: once as larvae, once as nymphs, and once as adults.

*I wait hours before I attach. Then I take up to 24 or more hours to get ready to suck your blood. I can pass diseases ONLY once I've started feeding. That means that you have plenty of time to find me and take me off.*



*Under a magnifying glass you can see me. Otherwise I am really quite small!*

Photo Courtesy  
Minnesota Department  
of Health - Disease  
Prevention and  
Control

**Least TOXIC**

## Tips

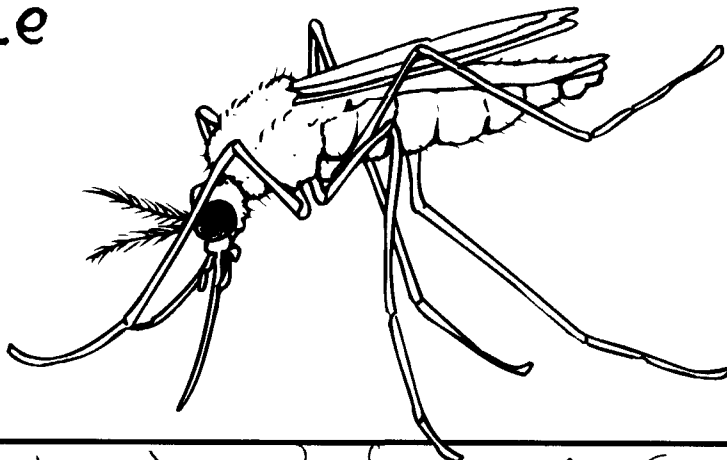
### Avoid Tick Bites!

1. Dress right! See page 11.
2. At home, check yourself from head to toe. Check your clothes, body, and hair for ticks.
3. Ask an adult to pull any ticks off with tweezers.

**Stop!** If you feel like you have the flu after being in the woods, or if you get a rash where a tick bit, see a doctor. These could be signs of Lyme Disease. A doctor can help you get well.

**For more about Lyme Disease, see:**  
<http://www.cdc.gov/ncidod/dvbid/lyme/>

# Join the Tree Hole Mosquito Patrol!



**M**osquitoes bite and make you itch. They can also make you sick. Some mosquitoes lay eggs in ponds or swamps. The tree hole mosquito can lay eggs in your yard! It breeds any place it finds still or slow-moving water. That includes tree holes that hold water.

This mosquito finds lots of other places to lay eggs, too. You'll see 10 in the picture. Cross them out. Then go on a mosquito patrol in your own neighborhood. Turn over empty pots. Dump water from toys. Don't grow mosquitoes in your area!



**COLOR  
THIS**



**Did  
You know?**

Some mosquitoes can carry the **West Nile Virus**. Very few mosquitoes carry it, but children can get sick if bitten by one that does.

## **Skeeter Scat**

**Least  
TOXIC**

## **Tips**

- Read labels on all repellents and avoid over-use of pesticide products.
- Wear light, loose clothing to cover your skin.
- Stay inside one hour before and after sunset when mosquitoes are most active.



# Mosquito-Eating Machines

**M**osquitoes have a place in the food chain, but not on your skin. Bats and birds are mosquito patrols, too. Build a bat house and you'll have fewer mosquitoes!

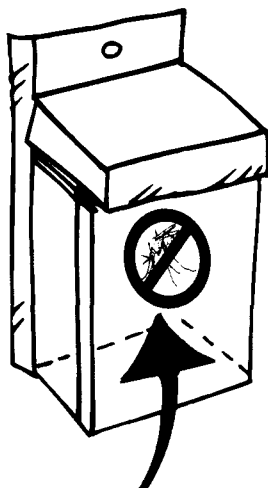
**Try This!**

## Build a Bat House!

- *Woodworking for Wildlife* by Carroll Henderson has a bat house plan. You can build it from one piece of lumber for \$5.00.

For more, see

- <http://www.batcon.org/bhra/bhcritter.html>



Enter at the bottom!

COLOR THIS

If you knew me better, you'd really like me!

If I swoop and zigzag overhead, I am simply catching insects using **echolocation**.

Echolocation is a bat's way to navigate using echoes of its own signals.



**W**hat does one big brown bat eat each night? Use the **clues** to find out!

A bat eats between \_\_\_\_\_ and \_\_\_\_\_ mosquitoes and other insects each night.  
(A) (B)

## Clues

How many years in a century? \_\_\_\_\_

Add a zero. \_\_\_\_\_

Multiply times 3. (A) \_\_\_\_\_

How many pennies in a dollar? \_\_\_\_\_

Multiply times the number of days in a week. \_\_\_\_\_

Add one more zero. (B) \_\_\_\_\_



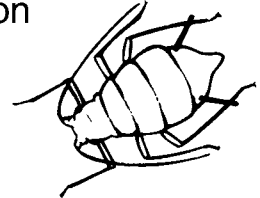
# Pests have enemies, too!

## Aphids and Ladybugs

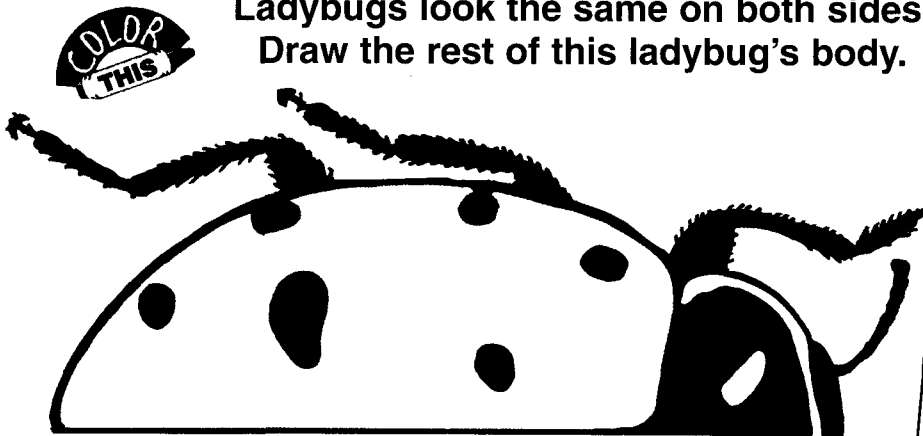


**A**phids are tiny insect pests. They suck the sap from plants—vegetables, crops, flowers, and trees. They take away the plant's nutrients, and they can give the plant viruses. Aphids attract even more pests to the plant with the sweet, sticky juices they make.

Natural enemies that gobble up aphids are lacewings, assassin bugs, wasps, spiders, and chickadees. But ladybugs (ladybird beetles) are the champion aphid eaters.



**Ladybugs look the same on both sides.  
Draw the rest of this ladybug's body.**



Ladybugs won't harm any of your plants, but they eat many pests that do! Let ladybugs do their work!

For more on ladybugs, visit the National Wildlife Federation's Back Yard Wildlife Habitat Program:  
<http://www.nwf.org/backyardwildlifehabitat/goodbugsbadbugs.cfm>. Click on the picture of ladybugs about half way down the screen.



### Tips

#### For fighting aphids

- Pick off aphids from the underside of leaves, or spray them with water.
- Grow plants such as marigolds that attract aphids' natural enemies.
- Buy a bag of ladybugs from a garden nursery. Set them free in your yard.
- Many trees, shrubs, and flowers have resistance to aphids. Call your local agricultural extension service to identify resistant types for your yard.

- When it hatches, a ladybug larva will eat about 400 aphids. As an adult, it may eat up to 5,000 more aphids!
- Insect sprays are the ladybug's number one danger!



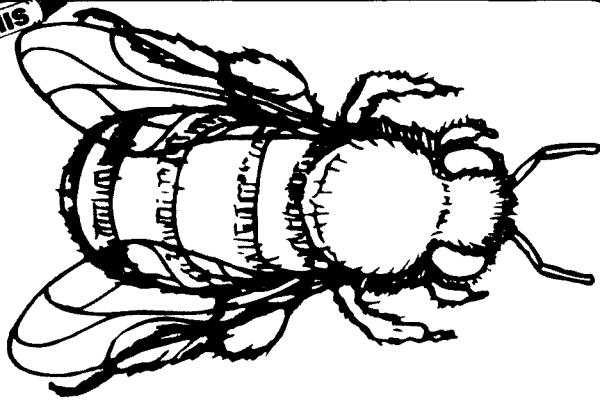
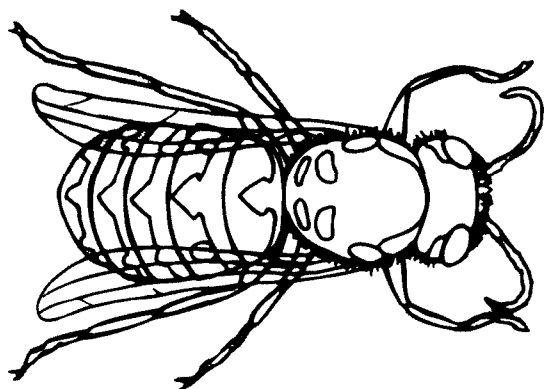
# What's all the BUZZZZZZzz?

**H**oneybees and wasps sting to defend themselves, NOT to attack. For bees and wasps, stings are a good way to keep people from bugging them. Bee stings hurt. They can even be deadly if someone is allergic.

## Did You know?

- Honeybees collect pollen and carry it in a basket of stiff hairs on each hind-leg. When they rest, their wings are flat.
- Wasps do not have "pollen baskets" and do not collect pollen. When they rest, their wings are folded back and look narrower than a bee's wings.

**Which is which? Label and color the wasp and the honeybee. Circle the pollen baskets on the honeybee.**



## Tips

### Prevent Stings!

Try not to attract bees. If they come around, **don't frighten them**. Check what you should do in areas with bees:

- " Avoid using scented products. This means hair spray, scented soaps, perfume, and lotions.
- " Avoid brightly colored clothes, especially flowered patterns.
- " Keep food and soda cans covered.
- " Wear hats, shoes, and long pants.
- " If a bee comes around, hold very still.
- " If a bee lands on you, don't swat at it. Don't panic! Just blow at it gently. It will move.



### First Aid

**If you get stung**, have an adult remove the stinger as soon as possible.

- Wash the sting with soap and water.
- Put ice or cool water on it for 10 to 30 minutes.
- To ease the pain and itching, try putting one of these on the sting: alcohol wipes, or a paste made of baking soda and water or meat tenderizer and water.

A. A bee flying backwards.  
B. A wasp flying forwards.

Without pollinators, we wouldn't have agriculture!

# Monster caterpillar



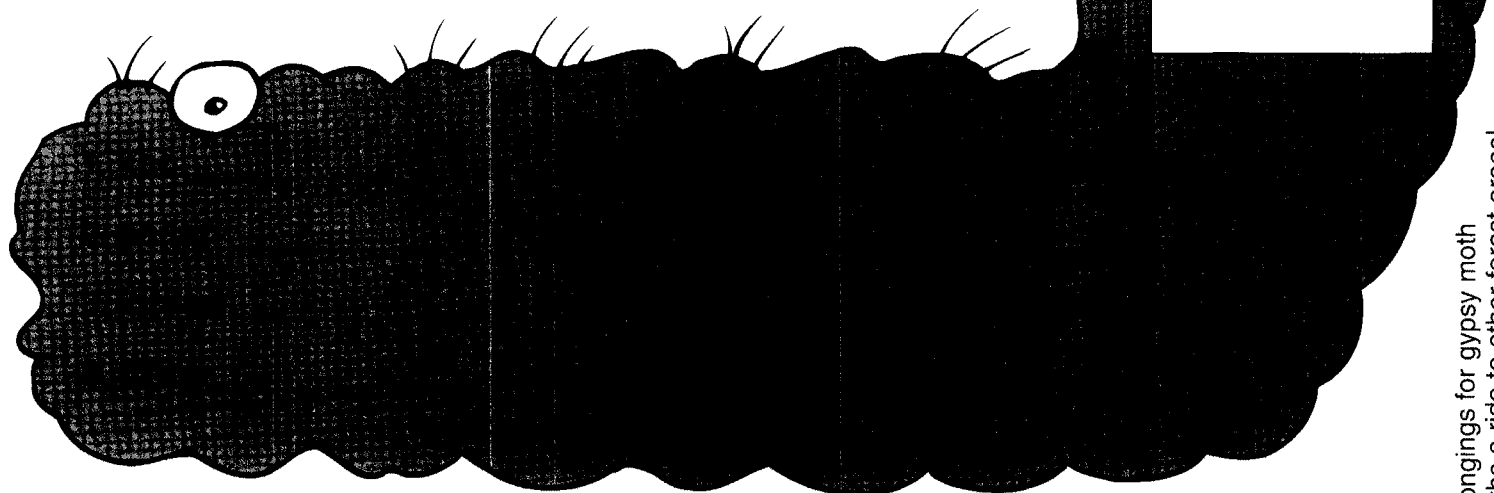
**W**hat's the number one tree pest in the USA? It's the gypsy moth caterpillar. These large, hungry pests eat the leaves of trees in early summer. This is the hardest time for trees to repair themselves. Gypsy moth caterpillars damage and kill trees.

Gypsy moth caterpillars also bug humans. In early summer, they hang and drop from trees. They mess up outdoor areas where humans like to relax. Their hair also causes allergic reactions in some people.

**What kinds of trees do gypsy moths like best?**  
To find out, unscramble the trees this caterpillar ate.

## WORD BANK

apple  
aspen  
basswood  
birch  
maple  
crabapple  
oak  
poplar  
box elder  
willow

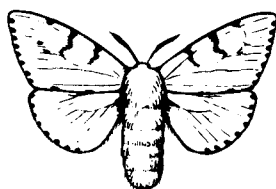


Learn to identify the gypsy moth in every stage of development.  
Number the life cycle stages in right order, from egg to adult.



**A**

#



**B**

#



**C**

#



**D**

#

<http://www.fs.fed.us/ne/morgantown/4557/gmoth/>

Travelers and campers beware! Check your belongings for gypsy moth caterpillars and pupal cases. Don't give gypsy moths a ride to other forest areas!



# Wise up to WORMS

EXCUSE ME,  
you're standing on  
20 nematodes (microscopic parasites and predators),  
200,000 algae (microscopic plants),  
yards of fungi,  
thousands of protozoa,  
and up to a billion bacteria...  
in 1 teaspoon of soil!



**H**ealthy plants more easily resist pests. Plants grow healthy in good soil. And earthworms help make good soil.

Earthworms are little "soil plows." They move bits of soil and make tunnels. This lets in air and water for animals and plants in the ground. Worms carry leaf bits and other materials into the soil, making it richer for plants. Earthworms eat soil and leave castings, little piles or pellets ("worm poop"). Castings hold nutrients that passed through the worm, and they improve the soil. Way to go, worms!

Why do you think robins tug so hard to pull earthworms from the soil?

**Try This!**

## Worm - a - rama

A cool, moist day or evening is a great time to find earthworms. Look in garden soil, vacant lots, lawns, parks, or pastures.

1. Look at the soil surface. Castings are clues.
2. Dig a spadeful of soil. Sort through it for earthworms. Look at them through a hand lens. Look for:

**Setae** (bristles that help worms grip soil and crawl)

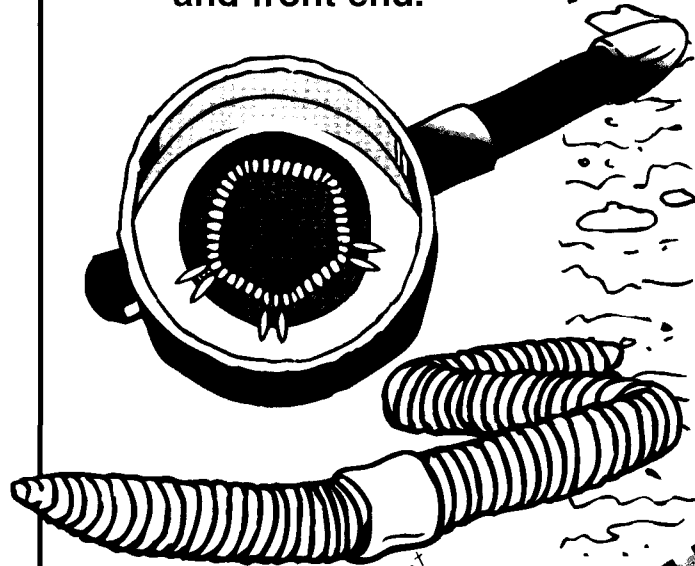
**Slime coating** (keeps skin moist so worms can breathe)

**Front end** (usually goes forward first)

**Clitellum** ("collar" or band that's only on adult worms)

3. After you study the worms, put them back on the soil, please.

**Label the clitellum, setae, and front end.**



**COLOR THIS**

Worms can turn your old food into plant food. Try vermicomposting (composting with worms). For tips on how to vermicompost, see: <http://www.niehs.nih.gov/kids/worms.htm>

A baby robin will eat 14 feet of earthworms before it leaves the nest!

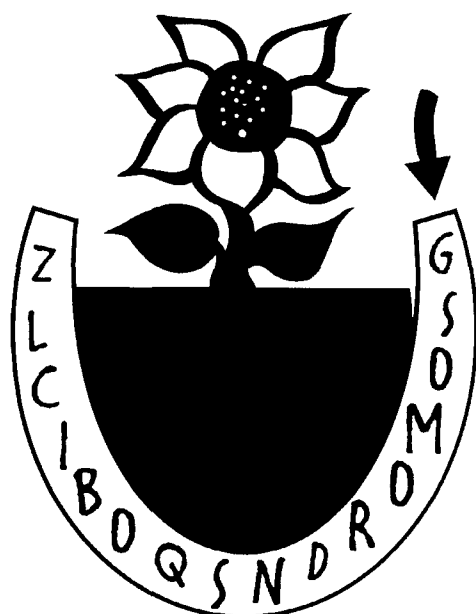
**Did You Know?**



# Crazy about Compost

Composting saves landfill space and turns garbage to goodness. Try it at home or at school!

What do you get from compost? To find out, start at the arrow and write down every other letter in the space below.




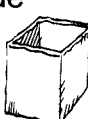


Loose soil makes it easier for plant roots to spread out.

**Try This!**

## Make your own compost.

You need:

- **Garbage** , OR , at least 3 feet wide and 3 feet deep
- Big plastic **garbage bags** to line the  or 
- **Soil** (with earthworms and bugs)
- **Twigs or wood chips**
- **Compost ingredients**
- A long **stick** or **shovel** to stir the compost

### Before you start:

Ask an adult to help you poke 25–30 small holes in the lid, sides, and bottom of the can for air and water.

**Step 1.** Build up layers. Each layer is about 8 inches thick.

**Step 2.** Pour on enough water to moisten the pile.

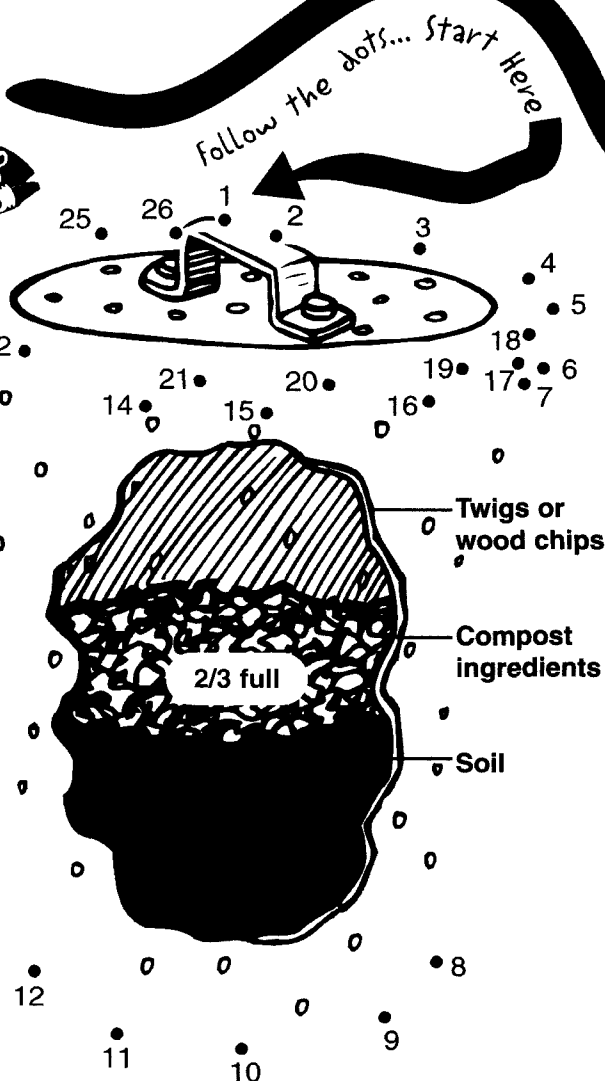
**Step 3.** Make more layers and water them.

**Step 4.** Each time you add compost ingredients add a little soil.

*Let nature's recyclers go to work!*

Use the stick or shovel to mix the pile every two to four days. In one or two months, your compost will become dark brown and crumbly. It is ready to use on your lawn, houseplants, or garden!

**COLOR THIS**





Don't put meat, dairy products, or animal poop in your compost. They will make it smell bad—and attract pests!!

# Don't miss Mulch

MULCH is a layer of nonliving materials. People can spread it on top of the soil around plants. Why use mulch? Mulch shades and cools the soil. It keeps moisture in the soil. Mulch protects the soil from packing down. Best of all, it stops pesky weeds from growing. Mulch can be:

- Wood chips
- Dry leaves
- Grass clippings  
(with NO weeds or chemical weed killers)
- Rocks
- Compost

Compost ingredients:

Fill in the missing vowels.

**A** c\_\_ff\_\_

gr\_\_nds)

**B** gr\_\_ss

cl\_\_pp\_\_ngs

**C** f\_\_d scr\_\_ps

**D** d\_\_c\_\_y\_\_ng

l\_\_v\_\_s

**E** v\_\_gg\_\_

p\_\_ls

**G**

fr\_\_t  
c\_\_r\_\_s

lls  
ggsh

**F**

Try This!

**How thick should a mulch layer be? See for yourself!**

First, choose two plants growing in your garden, yard, schoolyard, or nearby park. Then...

1. Put 1 inch of mulch around the base of plant #1.
2. Put 3 inches of mulch around plant #2.
3. Check in one month.

I predict \_\_\_\_\_

This is what happened: \_\_\_\_\_

What I want to know now: \_\_\_\_\_

## Go on a Mulch Hunt!

How many places can you find mulch around plants?

- |              |                   |              |
|--------------|-------------------|--------------|
| " Gardens    | " At home         | " Parks      |
| " Schoolyard | " Neighbor's yard | " Boulevards |

Place	Kind of mulch	Any Weeds?	
		Yes	No

# THE WEB OF LIFE

**D**id you know that there are many more kinds of insects on earth than any other kind of living creature? It's hard to imagine, but 95% of all the animal species on the earth are insects! Millions of insects can exist in a single acre of land! Over one million species have been discovered by scientists, and they think that there might be ten times that many that have not been named yet! All of these insects are part of what is called the "web of life."

Draw and color a picture with a critter you read about in this book.

**Show:** what it eats  
what eats it  
if it helps something grow

Add other organisms to your picture to make a web of life.



**Think:**

- What does it eat?
- Does it help something grow?
- Is it food for another creature?

Everything has a place  
in the web of life.

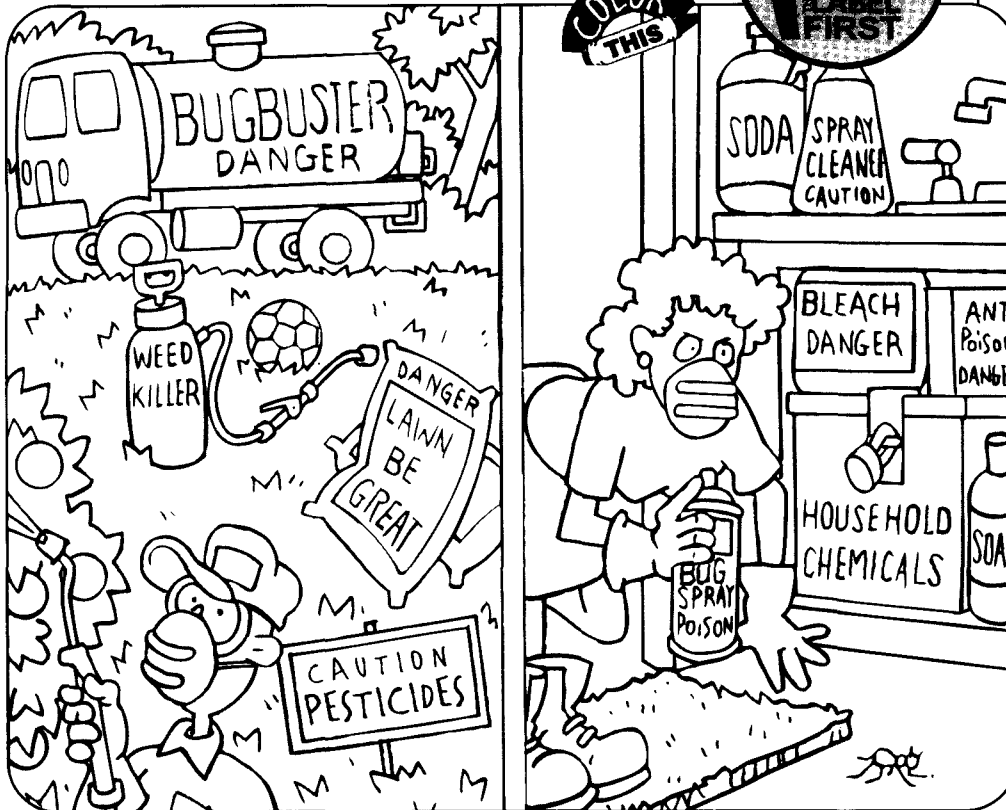
**Tell a friend or parent  
what this means.**



# Plan for pesticide safety!

## Care for Your Plants, Family, and Pets

Sometimes people buy and use pesticides. Pesticides are chemicals that get rid of pests. They are poisons. Pesticides may accidentally get into our bodies and make us sick. They can get into our bodies if we touch them, breathe them, or swallow them. Find pesticides in the picture. Underline words that warn you that they are poisons.



## Think Again! Talk with your family:

1. Do lawns and parks really need to be totally weed free?
2. How do some insects help your lawn and plants?  
Do you really need to get rid of ALL insects?
3. Can you put up with fruits and vegetables that aren't perfect—when they are grown without pesticides?

## Least Toxic Tips

### Play it safe when using pesticides!

- Either take your shoes off at the door or wipe shoes carefully on a rug-type door mat. How would this help?

- Always store pesticides in their original container. How would this help?

- Wash fruits and vegetables with water. Scrub them with a brush. Peel them if possible. How would this help?

# Are you Qualified for Pest Patrol?

Choosing from many ways to manage pests is called integrated pest management, or IPM.

Match each pest problem with the least toxic way to attack it.  
Then try these ways when you need to pester pests!

Do you know how to prevent each of these pests from becoming a nuisance? Draw a line to connect each question with the correct answer. Need help? Look throughout this book to find the answers.

- |   |  |
|---|--|
| <b>1</b> You see purple loosestrife. What do you do?                  | <b>A</b> Tuck your pant legs into your socks when walking in tall grass or areas where these insects may live. |
| <b>2</b> How do you keep roaches out of your home?                    | <b>B</b> Be very still. Don't panic! Just blow at it gently. It will move.                                     |
| <b>3</b> What should you do to avoid tick bites?                      | <b>C</b> Pull it up right away. Put the pieces in plastic bags.  |
| <b>4</b> How do you keep mosquitoes from using your yard to lay eggs? | <b>D</b> Make sure there are no open containers with water, where these biters can breed.                      |
| <b>5</b> A bee lands on you. What do you do?                          | <b>E</b> Keep food in closed containers, clean up crumbs, and take the garbage out every day.                  |



With the right information and tools, we can solve our pest problems... **AND** be friends to Earth and nature!

## That's IPM!

Starlings and some other songbirds use natural pest-killers. They line their nests with special plants that give off chemicals that help keep tiny, blood-sucking animals away from their young.



**Did You Know?**





# Glossary

**Allergic reaction** - Can include rash, itching, swelling, sneezing, runny nose, or trouble breathing due to contact with things a person is allergic to.

**Bug** - General term for insects. Little creature with multiple legs.

**Castings** - "Worm poop" that forms pellets or small piles. Earthworm castings put nutrients back into the soil.

**Caterpillar** - What a moth or butterfly looks like in the larval stage of its life cycle.

**Compost** - A mixture of organic materials, such as yard and food waste. Added to your garden, it nourishes the soil and plants.

**Insect** - An organism with three body parts (head, thorax, abdomen) and three pairs of jointed legs. Most numerous type of creatures on earth.

**Insecticide** - A pesticide that kills insects.

**Integrated Pest Management (IPM)** - Choosing among various ways to treat pest problems. The goal is to cause least harm to the environment.

**Larva** - The second developmental stage for an insect that has a four-stage life cycle: egg, larva, pupa, adult.

**Lyme Disease** - A flu-like illness caused by the bite of an infected deer tick.

**Mulch** - A layer of material that gardeners place over the soil to reduce weeds and hold moisture.

**Native** - A plant or animal that is an original inhabitant of where you live.

**Natural Enemy** - Something existing in nature that kills or eats an organism.

**Nutrients** - Substances that organisms need to live and grow.

**Nymph** - A young insect that has not yet developed into its adult stage. Nymphs look like adults but lack fully-formed wings.

**Organism** - A living plant or animal.

**Parasite** - An organism that lives off another organism in a way that harms it.

**Pathogen** - Something that causes disease or death in an organism.

**Pest** - Something that shows up where you don't want it. Examples can include weeds, insects, mold, rodents, and bacteria.

**Pesticide** - A substance used

for keeping pests away, killing them, or reducing their numbers. EPA registers — or licenses — pesticides.

**Poison** - A substance that kills, injures, or impairs an organism through chemical action.

**Predator** - An organism that kills and eats other organisms.

**Prey** - An animal that another animal hunts for food.

**Spore** - A single plant or animal cell that is able to grow into a new plant or animal.

**Toxic** - A word that means "poisonous in certain amounts."

**Weed** - An unwanted plant.

# Web Resources

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## Just for Kids

A Roach Prevention Activity Website for Kids (EPA)

<http://www.epa.gov/pesticides/kids/roaches/english/>

Backyard Wildlife Habitat Program (National Wildlife Federation)

<http://www.nwf.org/backyardwildlifehabitat/>

Bugged by Bugs" (Girl Scouts Mile Hi Council)

<http://www.buggedbybugs.girlscoutsmilehi.org/>

Criteria for Successful Bat Houses (Bat Conservation International)

<http://www.batcon.org/bhra/bhcriter.html>

Composting for Kids (Texas A & M University)

<http://aggie-horticulture.tamu.edu/sustainable/slidesets/kidscompost/cover.html>

Green Squad (National Resource Defense Council)

<http://www.nrdc.org/greensquad/>

Gypsy Moth in North America (USDA Forest Service Northeastern Research Station)

<http://www.fs.fed.us/ne/morgantown/4557/gmoth/>

Kidzone (The National Wildlife Federation)

<http://www.nwf.org/kids/>

Thinking Fountain: Dandelion (Science Museum of Minnesota)

<http://www.smm.org/sln/tf/d/dandelion/dandelion.html>

Vermicomposting Kid's Page (National Institute of Environmental Health Sciences/HHS)

<http://www.niehs.nih.gov/kids/worms.htm>

Who Wants to be an IPM Super Sleuth? (The IPM Institute of North America)

<http://www.ipminstitute.org/supersleuth.htm>



## For Teachers, Parents, and Other Caregivers

Audubon at Home (National Audubon Society)  
[http://www.audubon.org/bird/at\\_home/index.html](http://www.audubon.org/bird/at_home/index.html)

Centers for Disease Control and Prevention's Lyme Disease Home Page (CDC/HHS)  
<http://www.cdc.gov/ncidod/dvbid/lyme/>

Centers for Disease Control and Prevention's Rodent Control (CDC/HHS)  
<http://www.cdc.gov/rodents/>

Citizen's Guide to Pest Control and Pesticide Safety (EPA)  
[http://www.epa.gov/oppfead1/Publications/Cit\\_Guide/citguide.pdf](http://www.epa.gov/oppfead1/Publications/Cit_Guide/citguide.pdf)

Cooperative State Research, Education, and Extension Service State Partners  
(U.S. Department of Agriculture)  
[http://www.csrees.usda.gov/qlinks/partners/state\\_partners.html](http://www.csrees.usda.gov/qlinks/partners/state_partners.html)

Green Landscaping: Greenscapes (EPA)  
<http://www.epa.gov/greenscapes/>

Health Topics A to Z (CDC/HHS)  
<http://www.cdc.gov/health/>

How to Use Repellents Safely (EPA)  
<http://www.epa.gov/pesticides/health/mosquitoes/insectrp.htm>

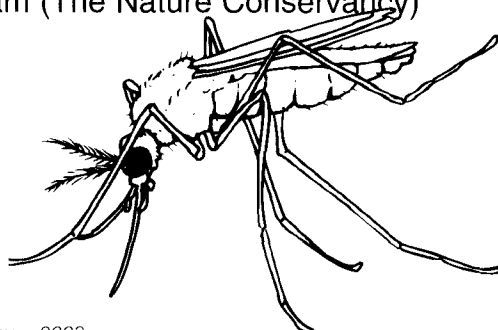
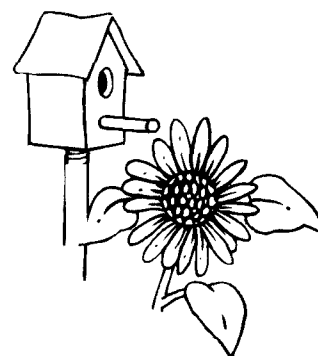
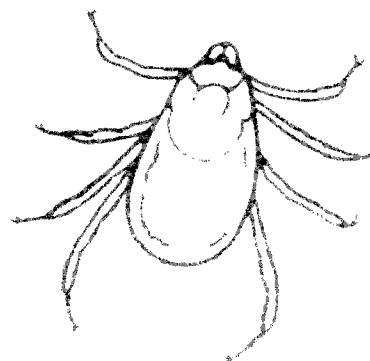
Integrated Pest Management in Schools (EPA)  
<http://www.epa.gov/pesticides/ipm/brochure/index.htm>

Mid-Atlantic Region Green Landscaping (EPA - Region 3)  
<http://www.epa.gov/reg3esd1/garden/index.htm>

Outsmarting Poison Ivy and Its Cousins (U.S. Food and Drug Administration)  
[http://www.fda.gov/fdac/features/796\\_ivy.html](http://www.fda.gov/fdac/features/796_ivy.html)

The American Lyme Disease Foundation (American Lyme Disease Association)  
<http://www.aldf.com/>

Wildlife Invasive Species Team (The Nature Conservancy)  
<http://tncweeds.ucdavis.edu/>





# Customer Feedback Form

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1. How did you find out about this activity book?
2. If you are a teacher, what grade do you teach?
3. What activities did you find most useful and why?
4. Which activities were least useful and why?
5. Do you have any suggestions for additional activities, Web links, or resources that we might include in a revised activity book?
6. Do you know other people or organizations that might find this book useful?
7. Do you have any other suggestions?

Please send, fax, or e-mail your completed form to:  
Kathy Seikel, Office of Pesticide Programs  
U.S. Environmental Protection Agency  
1200 Pennsylvania Ave., NW (7506C)  
Fax: (703) 308-5558  
[seikel.kathy@epa.gov](mailto:seikel.kathy@epa.gov)

*Thanks for your comments!!*



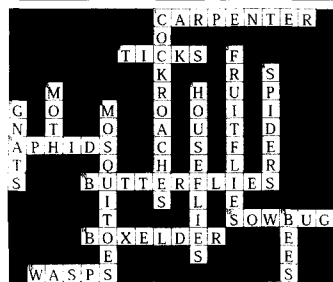


# Answers

## PESTS OR GUESTS, p. 1

1. P, grub
2. P, worm
3. G, bee
4. P, cockroach
5. G, spider
6. P, mosquito
7. P, ants
8. P, wasp

## INSECT PESTS AND PALS, p. 2



## THE 3 P'S IN ACTION, p. 3

1. parasite
2. pathogen
3. predators

## GREEN, GREEN GRASS, p. 6

1. Grass needs nothing.
2. fertilizer
3. nothing
4. fertilizer

## PURPLE PLAGUE, p. 8

Florida, Hawaii

## BEWARE, p. 9

Milfoil

## OUTSMART THOSE PESTS, p. 10

1. birdhouses, sunflowers
2. toads, slugs
3. garbage
4. crumbs
5. screens
6. tomatoes

## MAZE, p. 11

Pests can get into any opened or spilled containers.

## COCKROACH MENU, p. 12

VRNUJYQSPCGDJHHJRZ  
 (F)INGER(N)AIL(C)UTTING(S)  
 PMBTSJHWGUGDUYDRRTY  
 ZGEVK(R)STIDIKIGZO(V)BO  
 CZSGVOOP(I)QVPZ(IC)RGAW  
 QWXLVS(D)OUCLEHRWEEMW  
 HTHUBED(K)ARVYWIACIG  
 YAGE(I)QZY(I)NNIOMP(S)RKL  
 UXUOW(I)QVI(N)NND(L)ESMC  
 SRENAC(S)OAP(M)NT(I)ETKE(C)  
 QCXNDEY(T)CKX(X)DBL(M)PNR  
 ULLPSCWKHXQ(L)INUGCH(U)  
 OSPOLXOB(CY)UOC(N)TXQM  
 UWPEUVEEGENNWE(C)TK(B)  
 ZHUCA(P)ET(FOOD)PEM(L)ES(S)  
 PQDORMMYDBAZ(X)ERHP(Y)

## MOSQUITO-EATING MACHINES, p. 15

3,000 and 7,000 mosquitoes

## WHAT'S ALL THE BUZZZ?, p. 17

- A. wasp
- B. honeybee

## GYPSY MOTH, p. 18

1. oak
2. aspen
3. poplar
4. apple
5. crabapple
6. birch
7. maple
8. willow
9. basswood
10. box elder

## CRAZY ABOUT COMPOST, p. 20

Good soil.

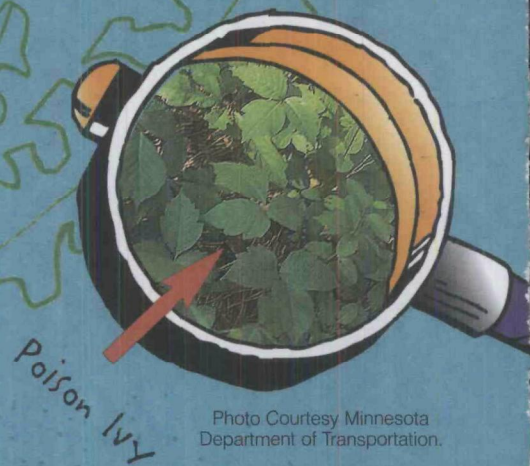
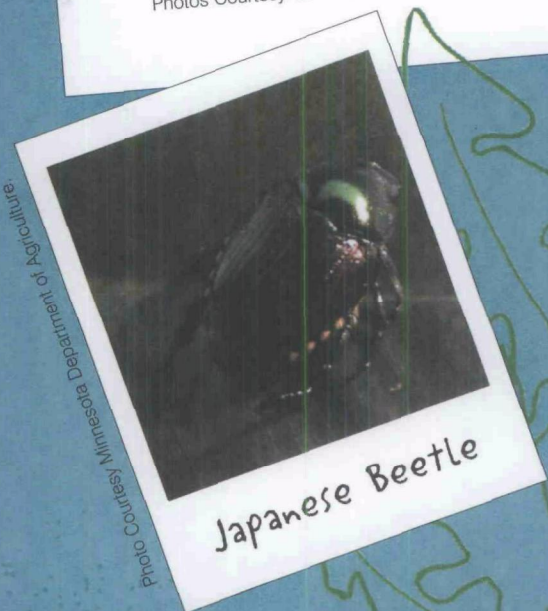
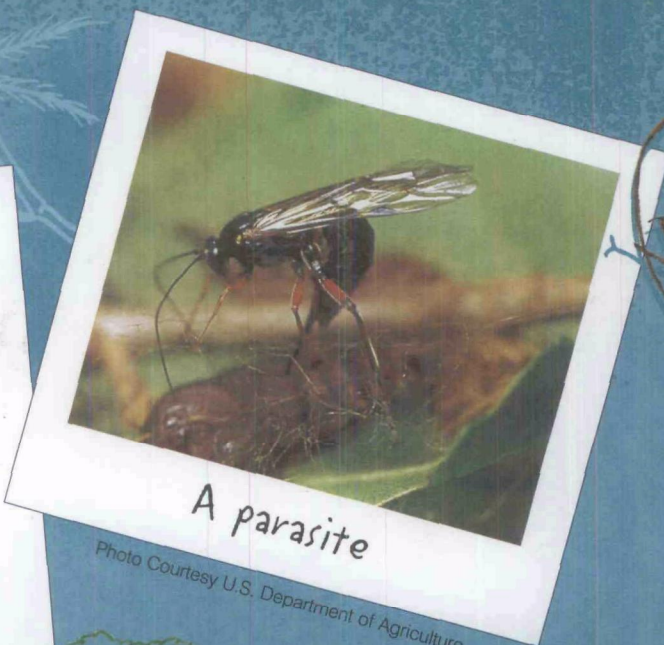
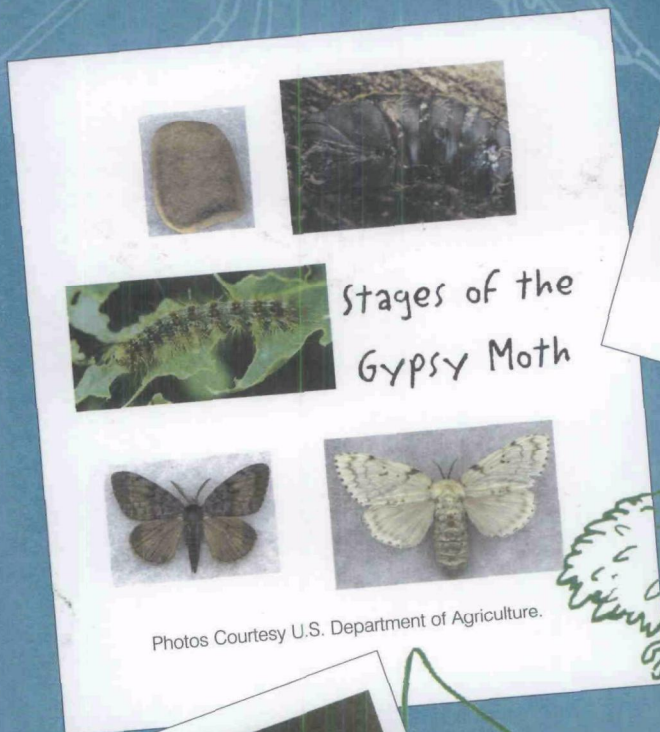
## COMPOST INGREDIENTS, p. 21

- A. coffee grounds
- B. grass clippings
- C. food scraps
- D. decaying leaves
- E. veggie peels
- F. eggshells
- G. fruit cores

## ARE YOU QUALIFIED FOR PEST PATROL?, p. 24

1. C
2. E
3. A
4. D
5. B





**United States Environmental Protection Agency**  
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