



Integrated Pest Management

A curriculum module for high school science classes
from Toxic Free NC, www.ToxicFreeNC.org

Welcome educators, students, parents and friends!

In 2006, North Carolina adopted the School Children's Health Act, a law that requires all public school districts in our state to use Integrated Pest Management, or IPM, by the year 2011. IPM is a prevention-based approach to pest management that drastically reduces the risk for student and staff exposure to pesticides at school.

>>See the text of the School Children's Health Act on the NC Legislature's website at:
<http://www.ncleg.net/Sessions/2005/Bills/House/HTML/H1502v3.html>

This IPM curriculum module was designed to help students explore environmental health and pest management in their real life, every day environments. It has built in opportunities for students to improve pest management practices in their own homes, schools, and communities.

It was developed and piloted with a ninth grade biology class, and can be easily tailored for use in biology and environmental science classes across high school and upper middle school grades. It directly addresses several competency objectives under the NC Standard Course of Study for Biology, including 3.05, 4.03, 4.04 and 5.03, and can also be easily customized to address objectives 2.04, 4.01, 4.02, 4.05 or 5.01.

>>Visit the NC Standard Course of Study for Biology on line at:
<http://www.dpi.state.nc.us/curriculum/science/scos/2004/23biology>

We designed this module according to the following principles:

- Teacher choice – We present the module as a menu so you can choose among options to create the best fit for your students.
- Student choice – At the end of the module, students can continue to explore the topics that most captivate them.
- Inquiry-based, collaborative learning – You can act as a resource while students work in small groups to conduct local investigations and Internet research.

A special invitation for North Carolina educators: Toxic Free NC, a non-profit environmental group, is available to help you use this module successfully with your class. Staff or volunteers from the organization may also be able to visit your class as a guest speaker, or help to arrange related field trips in your area. Please don't hesitate to contact Toxic Free NC at (919) 833-1123, or info@toxicfreenc.org for more information!

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This curriculum module is the product of a two-year collaboration between:

- Julie Wilson, UNC-Chapel Hill Community Writing Center; Ph.D. Candidate, UNC Chapel Hill School of Education
- Judy Jones, East Chapel Hill High School
- Billie Karel, Toxic Free NC

With special thanks to the following for their contributions, reviews, and other assistance:

- East Chapel Hill High School
- Michele Kloda, Morehead Planetarium and Science Center
- Allen Spalt, Board President, Toxic Free NC
- Elissa Totin, UNC-Chapel Hill Environmental Resources Program
- Anne Bunnell, East Carolina University Department of Biology



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Menu Design:

We present the module as a menu with the following courses:

- The appetizer is an introduction to Integrated Pest Management.
- Entrees focus on pest control practices in the students' own environments.
- Side Dishes provide content enrichment to complement the entrees.
- Desserts allow students to make action plans or conduct further research.

Menu of Activities and Resources

A P P E T I Z E R	<p style="text-align: center;">Introduction to Integrated Pest Management (IPM)</p> <ul style="list-style-type: none"> • For the teacher: Core Learning Questions • Introduction to IPM • <u>When Is a Pest?:</u> http://paipm.cas.psu.edu/schools/curriculum/eeipm.html#ipm • <u>IPM Pyramid of Tactics</u> http://paipm.cas.psu.edu/pdf/PyramidPDF1.pdf • <u>Videos "Putting Aside Pesticides" and "Kids and Chemicals":</u> http://paipm.cas.psu.edu/videos.html#Pgen 				
E N T R E E S	<p>Pests and Pest Control in Your School</p> <ul style="list-style-type: none"> • School Tour and Pest Mapping Activities • CHEJ's <u>Green Flag School Program:</u> http://www.greenflagschools.org • NRDC's <u>Green Squad Interactive Web Site:</u> http://www.nrdc.org/greensquad/intro/intro_4.asp 	<p>Pests and Pest Control in Your Home</p> <ul style="list-style-type: none"> • Home Pest Mapping Activity • <u>IPM for Homes</u> http://www.nysipm.cornell.edu/publications/homesbro/index.htm 	<p>Pests and Pest Control in Local Institutions</p> <ul style="list-style-type: none"> • Local Institutions Pest Control Inquiry Activity 		
S I D E	<p>Pesticides and Human Health</p> <ul style="list-style-type: none"> • Drawing Pesticide Exposure Activity • Environmental Exposure Demonstration <p><i>Other ideas: Toxicology & Epidemiology - look for current research on pesticides & human health</i></p>	<p>Pesticides and our Ecosystem</p> <ul style="list-style-type: none"> • Louisiana Public Broadcasting: <u>The Aggravation of Accumulation:</u> http://www.lpb.org/education/classroom/itv/environmentalstrikebox/teacherguide/module5/5accu.htm • National Geographic: <u>Alarming Frogs:</u> http://www.nationalgeographic.com/xpeditions/lessons/18/g912/hayes1.html 	<p>Biology of Pest Species</p> <p><i>Choose lessons on pest insect or plant anatomy and/or population ecology that are appropriate to curriculum goals and grade level.</i></p> <p><i>Ideas to focus on: Natural Selection & Resisitance, Population Biology.</i></p>	<p>Politics of Pests and Pest Control</p> <ul style="list-style-type: none"> • Who Makes Decisions about Pesticides? • Iowa State University: <u>IPM, Pesticides and Regulations. A Lesson Plan:</u> http://www.ipm.ias.tate.edu/ipm/schoolipm/node/77 	
D E S S E R T S	<p>Take Action!</p> <ul style="list-style-type: none"> • Pest Problem Action Plan Activity, Global Pesticide Issue Inquiry Activity, Community Activism Action Plan Activity • Writing as an Advocate for Change 				

One Teacher's Module:

Judy Jones created the following one-week module in her 9th grade biology class. (Note: There was a break to other curriculum activities for a week and a half between the introductory lesson and research assignments, and the rest of the module.)

- a. Appetizer: Guest speaker – Billie Karel from Toxic Free NC (www.ToxicFreeNC.org) talked with students about Integrated Pest Management and how they could influence school system decision making about pest management.
- b. Entrée: Pests and Pest Control in Local Institutions – Each group of 3-4 students researched and presented a PowerPoint presentation on a pest, a pesticide, and an institution.
- c. Side Dishes: Environmental Health & Pesticides – The Food Coloring Environmental Exposure demonstration and information about cholinesterase inhibition by organophosphate pesticides were included in the introductory lesson by the guest speaker.
- d. Dessert: Community Activism – Students wrote letters to their district school board to share information about IPM and suggest adoption of an IPM policy.



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Core Learning Questions

I. How can we apply scientific methods of observation, research, experimentation, risk and cost/benefit analysis to decision making about real-life problems, such as pest management? (scientific inquiry and science-based decision making, plant & insect biology, risk analysis, disease vectors, sustainable agriculture)

- a. What is a pest? What kinds of species are pests? What are their roles in the natural ecosystem? Why do they become pests?
- b. What are pesticides? What are some different classes of pesticide chemicals, and how do they function? What different ways are they used? What are some of the risks and benefits of their use?
- c. What are scientific approaches to managing pest populations? What are the costs and benefits - economic, environmental, human health, or other - of different methods of pest control?

II. How do everyday decisions about pest management affect the environment, and how does the environment affect our health?

- a. What is environmental health?
- b. How do pesticides and other pollutants get into our environment, and from there, how do they get into our bodies? (pollution sources, routes of exposure)
- c. How can pesticides and other pollutants affect the way our bodies function? (toxicology, cholinesterase inhibition, endocrine disruption, bioaccumulation)
- d. Why are children more vulnerable to health damage from pesticides and other pollutants in the environment than adults? (routes of exposure, teratogens, developmental biology)
- e. How can risks to human health and the environment be represented in pest management decision making?

III. What are effective ways we can work for pest management practices in our communities that best protect human health and the environment? (Civic participation, resolving environmental challenges)

- a. Who makes decisions about pesticide use and pest management in our daily environments?
- b. What are the priorities considered when making decisions about pesticide use and pest management - economic, health & safety, cosmetic, environmental, or other?
- c. How might decisions about pest management in our daily environments affect us? How can we affect the way those decisions are made? What are effective ways to communicate with decision makers about this?



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Integrated Pest Management: An Introduction

Guiding Questions (See also Core Learning Questions):

- What is Integrated Pest Management (IPM)? What are its goals? Where is it used, and by whom?
- What are some other common ways of dealing with pests, and how are they similar and different from IPM?
- What are pesticides, and what are they used for? How do they affect human health and the environment?
- How are decisions made about how to handle pest problems? What factors are considered?

Learning Goals:

- To get a basic understanding of Integrated Pest Management, and how it compares to other approaches to pest control.
- To introduce the terms and themes that will be emphasized throughout the IPM module.

Length:

One to two class periods.

Overview Description:

The introductory lesson on IPM is a time for the teacher or a guest speaker to set the stage for the whole module. It is not only an opportunity to introduce important concepts and vocabulary, but also to help students grasp why IPM is an important thing to study, how it relates to the environment and to health, and how it is relevant to students' everyday lives. You may want to bring in a guest speaker for at least part of the intro lesson, or incorporate a field trip or service trip during this early part of the module.

It is highly recommended that teachers or guest speakers introduce the main concepts of this module by drawing upon students' existing knowledge and experience of pest management in an interactive format. Here is one method that has worked extremely well, though of course this is only a suggestion and teachers should work in a fashion that best suits their class and the IPM module they've designed.

1) Using a blackboard or paper taped to the wall, create space for three lists with the following titles: PEST, PESTICIDE, and IPM.

2) Ask the class, what are examples of pests? Write responses under the heading PESTS and guide brainstorming as necessary. What makes these critters pests? Are they always pests, or

only in certain places, or at certain times? What role might these species play in a natural ecosystem when they are not pests?

3) Ask the class, looking at our list, what words do you think would be important to have in a definition of "pest"? Write responses on the list, and guide brainstorm as necessary. If important concepts are still missing, ask leading questions until you have the makings of your definition, then synthesize to a complete sentence or statement, which you write at the bottom of the list. (See reference definitions below.)

4) Repeat this process to define the term PESTICIDE (see reference definition, below).

5) Give students a hypothetical pest problem. For example, tell a short story about a house where there is a roach problem in the kitchen and living room. The family who lives there has two kids, one of whom is an infant, and they also have a dog. Ask the students, what are some ways the family might try to solve their cockroach problem? What might they do to prevent them from coming back? What economic, health and environmental risks should they consider? You can list responses on the blackboard or paper. You may ask them to brainstorm in small groups and then report back. If certain concepts are not well represented, you might ask leading questions, or add other things to the list.

6) Talk with students about pesticides and environmental health. How can pesticides and other environmental contaminants get into our bodies, or the bodies of animals (pets or wildlife)? What do they do when they're in there? This may be a good time to use the Environmental Exposure Demonstration, or to talk about cholinesterase inhibition, or other aspects of human exposure to pesticides.

7) Look back at the list of pest control options generated earlier - ask the students, which of these options have the lowest risk for human, animal, or environmental exposure to pesticides? List low-risk options under the IPM heading. Again, ask leading questions or give hypothetical situations if certain themes are not making it on to the list.

8) What are some common factors among the low-risk options that have been selected, that you think might be part of a definition of IPM? List responses, then synthesize into a definition sentence or statement.

9) Discuss North Carolina's new School Children's Health Act requirement that all public schools use IPM, and pose the question: where else in our community could IPM be helpful?

10) Use the remainder of the class period to introduce the activities and research projects you've chosen to use for the rest of the module.

Reference Definitions (adapted from EPA's Definitions:)

Pest: An animal, plant, fungus, or microorganism that is a nuisance, dangerous, or otherwise unwanted. Includes weeds, bugs, rodents, mold & mildew, and crop diseases.

Pesticide: A substance or mixture of substances put into the environment to kill, repel, regulate, or otherwise get rid of pest species. These include bug sprays, weed killers, rat poisons, and chemicals used to regulate crop growth.

Extra Pesticide Facts: Pesticides are poisonous - that is their job. Several types of pesticides are derived from poisons that were originally developed to be used as weapons during wars.

Integrated Pest Management, or IPM, is a common sense approach to pest problems that seeks to reduce reliance on toxic pesticides and minimize the risk for human or environmental pesticide exposures. It uses a prevention-based system to manage pest populations, and controls pest outbreaks using the least-toxic and lowest risk methods possible. (For more information, download a factsheet about Integrated Pest Management from www.ToxicFreeNC.gov.)



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Entrée: Pests and Pest Control in Your School

Guiding question:

How do pesticides get into the school environment?
What kinds of pest control measures are taken at the school?
When and how are those measures decided upon? Who makes the decisions?
Does the school's pest control policy meet the standards of Integrated Pest Management, as set forth by the NC School Children's Health Act? [Link to the School Children's Health Act: <http://www.ncleg.net/Sessions/2005/Bills/House/HTML/H1502v3.html>]

Learning goals:

To apply understanding of IPM to a particular context.
To decide and defend a conclusion based on inquiry.
To differentiate between structural, sanitation, physical and chemical pest control tactics.
To understand how pests enter human environments and the role humans play.

Length:

3 class periods

Activity descriptions:

Discussion: Students prepare for tour of school by generating questions.

1. Review information about IPM and the School Children's Health Act from introductory lesson.
2. As a class, list the guiding principles of IPM.
3. Set goal for discussion: The students' task on the tour will be to determine if the school uses IPM. They must come up with a list of questions that will help them make that determination.
4. Students have 10 minutes to work in small groups.
5. Groups report back and whole class decides on list of questions.

Tour: Pest control decision-maker takes class on walk-through of school

1. Students ask and record answers to questions.
2. Students take notes about pest problems and prevention measures highlighted on the tour.
3. After tour, students work in teams to discuss their findings.
4. Individually, students write brief reports describing the school's pest control policy and drawing a conclusion about whether the school uses IPM.

Mapping: Students map and analyze pest entry points and pest management strategies.

1. Students start with blank maps of school, probably available in central office. Work in small groups and returning to areas of the school as necessary, they create individual maps of the school building(s) and grounds.
2. Use IPM Pyramid of Tactics (<http://paipm.cas.psu.edu/pdf/PyramidPDF1.pdf>) to create key for map with different symbols for types of tactics – structural, sanitation, physical and chemical.
3. Use symbols to mark pest management strategies in use at the school.
4. Create key for pests with symbols for species of pests and mark pest entry points.
5. For each pest entry point, write a reason for the pest entry. This may require additional research.
6. As a class, discuss the reasons for pest entry at particular places. Discuss additional steps the school could take to prevent pests, and additional steps they as students could



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Entrée: Pests and Pest Control in Your Home

Guiding questions:

- a. How do pests get into your home? What makes them pests? What are the risks of different pest problems?
- b. How do pesticides get into your home?
- c. What kinds of pest control measures do you and your family take?
- d. How do you make these decisions?
- e. Do your pest control practices at home meet the standards of Integrated Pest Management? Why or why not?

Learning goals:

- a. To apply understanding of IPM to a particular context.
- b. To understand how pests enter human environments, the relative risks they pose, and the role humans play in encouraging or discouraging pest problems.
- c. To observe the life cycle of particular pests and understand what responses are most effective at different stages of that cycle.
- d. To analyze a pest problem, weigh the relative risks and benefits of different pest control scenarios, and decide and implement the most appropriate response.

Length:

2-3 class periods plus homework

Activity Descriptions:

- Students work in pairs. One student is responsible for mapping her or his home and the other is responsible for conducting research on a particular pest common in the home.
- Students can work together to create keys for the map. Use IPM Pyramid of Tactics (<http://paipm.cas.psu.edu/pdf/PyramidPDF1.pdf>) to create key of tactics, with different symbols for structural, sanitation, physical and chemical. Create second key for pests with symbols for species of pests.
- “Map student” works at home to draw map and use symbols to mark pest entry points by species and pest management strategies used.
- “Research student” researches life cycle and pest control alternatives for a particular pest common in the home.
- Students work together to discuss the map and write a reason for each pest entry noted. Together, they decide on the most appropriate method for dealing with the particular pest studied, write a step-by-step guide to this method, and present their findings to the class.



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Entrée: Pests and Pest Control in Local Institutions

Guiding questions:

1. What are the most common pest problems at certain community institutions? Why are those institutions particularly at risk for those pests? What risks do the pests pose to those institutions?
2. Who makes decisions about pest control measures? When and how are these measures decided?
3. Do you think the methods of pest control used are the most appropriate? Why or why not?
4. Which institutions in the community use Integrated Pest Management and which do not?
5. What's an effective way to write a letter of inquiry to somebody in business or the government to ensure a thoughtful response?

Learning Goals:

1. To apply understanding of IPM to a particular context.
2. To analyze a particular pest problem and decide on the most appropriate pest control response.
3. To communicate information and arguments based on information to an appropriate audience.
4. To collaborate on and present a PowerPoint presentation.

Length:

5-7 class periods

Activity Descriptions:

I. Initial Inquiry (2-3 class periods)

- Teacher assigns each group of 3-4 students an institution in the local community to research, or allows groups to choose from a menu. It is recommended that the teacher make a few phone calls in preparation for this activity to find best contacts for these institutions, and provide them to the student groups. Students may have personal ties to a particular place that would make research easier there, and they should feel free to use those.

Here are some suggested types of community institutions that students might research:

- childcare center
- restaurant
- grocery store
- church
- park and/or athletic field
- apartment building
- animal hospital, shelter, or kennel

- retirement community
 - hospital or doctor's office
 - office building
 - zoo
 - shopping mall
- Each student in the group takes on a different role in the research project. The “place” student is the liaison to the pest control decision maker at the community institution the group has chosen to research. With help from the rest of the group, this student should generate a list of questions to ask, and then conduct an interview with that pest control decision maker, either in person or over the phone. See tips for phone interviews. Note: The research work of the other 2-3 students in the group depends, to some extent, on information about pest problems and pesticide use obtained during this interview. This student should be particularly conscientious, and in case the first contact doesn't work out, should have a few back up contacts to try.
 - The “pest” student researches the anatomy, life cycle, and population biology of a particular species of pest that is problematic in the group's chosen institution, its role in a natural ecosystem, and the circumstances under which it becomes a pest. The teacher should help students to choose pest species so that there is not too much overlap within the class.
 - The “pesticide” student researches a product that is commonly used to control the problem pest in the group's chosen institution, if pesticides are used. The student can look into the chemical class, structure & properties of the chemical, its history and common uses, regulations governing its use, and possible alternatives to use of this chemical. If pesticides are not used to control the pest at the community institution, the student should look into a pesticide commonly used to control this pest elsewhere - what products are at the hardware store, or recommended by cooperative extension?

In some cases, the class will need to work on another project in class while conducting individual research on these topics.

II. Analyzing and Sharing Data (3-4 class periods)

- Students integrate data gathered to answer the following questions: What is the institution’s response to this particular pest problem? What are the risks and benefits of this response? Is it the best response given the situation? What other responses would the students suggest?
- Together, students create power point presentation to share with the class, showing findings from their research and their conclusions.
- Students follow up with institution contact to thank them and, where appropriate, offer information and suggestions about improvements to their pest control program. See Desserts: Community Activism Action Plan.



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Tips for Students: Phone Interviews

1. Introduce yourself with your first name, your teacher's name, your school, and a little information about your class project.

"I'm ..., I'm in Mrs. Jones' ninth grade biology class at East Chapel Hill High School. We're doing a unit on pests and pest control. My group is studying (schools, parks, restaurants, etc.)...."

2. Tell the person what they can help you learn.

"We're researching what kinds of pests you see in ... (schools, parks, etc.) and how you deal with them so we can understand the biology of pests and pest control better. It would help us a lot if you could tell us about your experiences."

If yes, ask "do you have a few minutes now to talk, or would it be best to make an appointment to talk another time?"

If no, be sure to thank the person anyway.

3. Ask questions and take notes about the answers. Ask them to repeat anything you don't get down. Ask follow up questions if something isn't clear.

What are the most common pests you see in different seasons?

What do you do to prevent pest problems from developing?

What do you do when there's a problem with a certain pest?

What pesticides do you use? How are they applied?

Do you use Integrated Pest Management?

Do you have a standard set of policies or procedures about pest problems that you follow?

Who makes decisions about your pest control?

What role can students and others play in preventing pests?

If you're calling an agency that does inspections (Health Department, Department of Environment & Natural Resources) ask these questions instead:

What rules do you have about pests and pest control?

How were these rules decided on?

How do you make sure that people are following the rules?

4. Thank them for their time.



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Side Dish Activity: Drawing Pesticide Exposure

Length:

Introduction and questions about assignment: 15 minutes

Complete assignment: depends on size and detail, also on use of art or computer graphics tools

Learning Goals:

To understand how environmental contaminants get into our bodies, and the types of effects they may have there.

To be able to both depict graphically and explain verbally how pesticide exposure happens.

Guiding Questions:

How do pesticides get into our environment?

How do pesticides get into our bodies?

What does “exposure” mean?

What sources of pesticide exposure can we control, and what sources can't we control?

What effect does a particular pesticide have on the way our bodies work?

What health problems can result from that effect(s)?

Activity description:

Students should work in small groups to research, and then draw (or otherwise depict with a collage? computer graphics? found objects?) a pesticide exposure, from beginning to end. You can assign students to work on a particular chemical, or have them choose one of their own. As a side dish for the Local Institutions Entree, it is suggested that students work in the same groups they are already in for their research projects, that they depict exposure to the same pesticide that the group is already researching, and that the final product can be incorporated into the final Powerpoint presentation.

The drawing can either be in "comic strip" form, with each frame depicting one step in the chain of events, or in the form of one drawing with different regions that each depict a different part in the chain of events leading to an exposure. Someone looking at the finished drawing should be able to understand the source of the exposure, i.e., how'd that chemical get there in the first place?; the route of exposure, i.e. how's that chemical get inside the body?, and the impact, i.e. how does that chemical damage the body?

For example, the drawing might be in comic strip form, and show an orchard where methyl-parathion is being applied to a peach tree. Then in the next frame, the peach (carrying the residue) is harvested and shipped to a grocery store. In the next frame, a family buys the peaches. In another frame, a person eats the peach, and is exposed to methyl-parathion through her or his digestive system. In the next frame, zoom in to see molecules of methyl-parathion, an organophosphate pesticide, bonding to molecules of acetyl cholinesterase (an important nervous system enzyme) and keeping them from breaking down acetyl choline. In the next frame, there is an excess of acetyl choline stimulating the neurons to fire, and in the final frame, the person feels dizzy or cannot concentrate.



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Environmental Exposure Demonstration

The following demonstration is credited to Michele Kloda, who was an Environmental Educator with UNC-Chapel Hill's Environmental Resource Program at the time of development.

It takes only a few minutes, and demonstrates in a striking visual way how exposure to environmental contaminants affects small children differently than adults.

Supplies:

2 glass vases, jars, or transparent containers for water. One must be significantly smaller than the other.
2 clothes pins
2 pictures (from photos or magazines), one of a small child's face, one of an adult's face
4 drops of food coloring
water

Preparation:

Tape one picture to each popsicle stick. Attach the picture of the small child to the smaller vase or jar, and the picture of the adult to the larger vase or jar.
Fill both containers with water.

Demonstration:

Invite a volunteer from the class to put two drops of "toxic chemical" (actually food coloring) into each vase or jar of water – no more, no less.
Wait a moment while the food coloring disperses in the water. While you are waiting, you can talk to the students about environmental exposures – what some common environmental contaminants are, how they get into our bodies, or special ways they can get into children's bodies in particular (for more information about these subjects, see the factsheet "Kids and Pesticides," available at: <http://www.toxicfreenc.org/informed/factsheets.html>)
Once the food coloring has dispersed, it should be obviously darker in the small vase, implying a higher concentration of the "contaminant" in the child's body than in the adult's body.
Explain that because children are smaller, and breathe faster, and drink more and eat more per pound of body weight, exposure to the same level of an environmental contaminant results in a higher load of that chemical in a child's body than an adult's. This is why special care must be taken to keep pollutants out of environments where children spend time, such as homes, childcare centers, and schools.



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Who Makes Decisions about Pesticides?

Decisions about pesticides are made at the federal (national), state, and local levels in the United States. Here's a short summary of who's in charge of what:

US Environmental Protection Agency (EPA):

- Practices of federal employees, in federal buildings
- Federal rulemaking authority [For example: Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and the Food Quality Protection Act (FQPA)]
- Registration of all pesticides (active ingredients only, not products) for use in the US
- More information on line at: www.epa.gov/pesticides

NC Department of Agriculture – Pesticide Section:

- Practices of state employees, in state buildings
- Enforcement of state and federal laws [For example: pesticide drift buffer zones, licensing]
- More information on line at: www.ncagr.com/fooddrug/pesticid/

NC Pesticide Board – appointed by governor and state agencies:

- Statewide rulemaking authority
- More information on line at: www.ncagr.com/fooddrug/pesticid/

County and City/Town governments, Boards of Education, other local governing bodies:

- Practices of employees, and/or at buildings or grounds of that jurisdiction
- More information can be found on city or town websites, school system websites, or at your county Board of Elections, which sometimes also has information on line.



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Desserts: Take Action!

At this point in the module, students can choose a subject that particularly interests them for further investigation and action. The idea is for students to put what they've learned into action, either by taking on a pest prevention challenge, finding ways to influence local level policies on pest management and pesticide use, or getting involved in state, national, or international efforts relating to least-toxic pest management, health, and the environment.

These research and action projects are intended to last through the semester or even the year, with students monitoring progress and reporting back to the classroom.

We designed these activity ideas to help students realize how they can make a positive impact on the world around them, and to foster a spirit of community involvement and civic participation. Please refer to Writing as an Advocate for Change.

1) Home Pest Problem Action Plan

This option follows naturally from either the School or Home Pest Control Inquiry Activities in the Entrees section. The student should research, choose, implement and monitor carefully a particular non-chemical (for safety reasons) pest management strategy in her or his home. Note: For safety reasons, students should choose a pest that is not very dangerous, such as household ants (not fire ants!), crickets, weeds (not poison ivy or oak!), mosquitoes, or flies. For any pest, the student should take adequate precaution to protect themselves from bites and stings. They should undertake these activities under close supervision from a parent or guardian. Their chosen IPM strategy should NOT involve the use of any chemical pesticide, and great care should be taken when using other household products for pest control, such as soap, vinegar, or borax cleaner, since they can also be irritants.

2) Community Action Plan

This option could easily follow the School or Local Institution Entrees. Students might choose to work towards a change of pest control practices in their school system or at another local institution – perhaps a place where someone in their family works or an animal environment such as a zoo or a vet's office. Students are strongly encouraged to contact the Pesticide Education Project in Raleigh for advice, sample documents they can use, and other useful information. Based on research conducted in the Entree section of the module, students will decide the most appropriate course of action to win a change in pest management practices – perhaps letter-writing, a petition, a presentation to a decision-making board, or a community panel presentation.

3) International Pesticide Issue Inquiry

This option could follow any of the Entrees. Students who are interested in learning more about national or international pesticide issues can independently or in pairs research a particular issue, and if they so choose, get involved in efforts for change or reform. There are many options for this type of research and activism project, but here are just a few ideas: the campaign for justice in Bhopal, farm worker health and pesticides (UFW or related), US EPA and pesticide testing with human subjects, or the Stockholm Convention on Persistent Organic Pollutants. Here are a few good starting places for research about these subjects:

Pesticide Action Network - www.pan-international.org

Beyond Pesticides - www.beyondpesticides.org



Writing as an Advocate for Change

The primary roles of an advocate are to explain the issue at hand in such a way that the truth of the matter is clear, and to express it to the right people at the right time to get the desired result! In general, writing as advocates for change, whether it's for a letter, for the press, for an essay or report requires that we are brief and persuasive, that we take a personal but respectful approach, and that we are clear and direct about our positions.

Letters are a very important way that citizens who choose to advocate for a particular type of change get this information across to the right people. Just follow these simple steps to write an effective advocacy letter:

- 1) Carefully choose your target, or the person you want to write to, and what you ask this person to do. You should choose someone who has some power to help further your cause or solve your problem, and you should ask that person to do something that is reasonably within her or his power to do. By the same token, you should try to choose someone who is accountable to you in some way, someone who has a good reason to care what you think about a particular issue.
- 2) Open your letter with a brief, direct statement of who you are and why you're writing. For example, "I am a 10th grade student at Durham School of the Arts, and I'm writing to ask you to vote YES on a new IPM policy for Durham Public Schools."
- 3) Tell your story. What reasons do you have for caring about this issue? Are you, or is someone close to you, directly affected by this issue? You should take any opportunities you might have to establish a connection with the person you're writing to. You can do this by acknowledging shared experiences, i.e. "like your son, my sister has asthma that can be triggered by exposure to pesticides." Or, you can do this by taking the time to thank the decision maker for things they've done in the past that you agreed with, i.e. "thank you very much for your vote in favor of ..."
- 4) What do you want this person to do? Don't be shy, tell them exactly what it is!
- 5) Why should they should do this thing? You should state the reason briefly here, and enclose additional documents or resources that explain the reasons further.
- 6) What information can you share with this person to support your position? Here, you should list each enclosure, or each resource you want this person to be aware of.
- 7) Briefly restate your request, and thank the target for her or his consideration.

8) How would you like this person to follow up with you, and by when? How will you follow up with them, if you haven't yet heard from them by that time? You should state these things clearly, but politely.

9) At the very bottom, after your closing and signature, you should list all of the people to whom you will send copies of this letter. This shows the person reading the letter that you are not the only person eager to hear about his or her response!