

# Anyone's Town

Lesson 1

First published in 1962, the book Silent Spring, by Rachel Carson, alerted the world to the dangers of misusing chemical pesticides. The effects of chemical pesticide use described by Carson can occur in any town, in any place. This activity is designed to introduce students to possible environmental and health hazards of chemical pesticides and allow them to begin exploring other means of managing pests besides using synthetic, chemical pesticides.

**Suggested Level(s):**

Grades 9-12

**Subject(s):**

Environment & Ecology;  
Reading, Writing, Speaking &  
Listening; History

**Standards:**

*Environment & Ecology*  
4.3 Environmental Health  
4.5 Integrated Pest Management  
4.8 Humans and the Environment

*Reading, Writing, Speaking &  
Listening*

1.2 Reading Critically in All  
Content Areas

*History*

8.2 Pennsylvania History

**Skills:**

Discussing, Comparing and  
Contrasting

**Technology Connection:**

Internet Resources

**Materials:**

*Silent Spring* by Rachel Carson  
Paper  
Pencil/Pen

**Time Consideration:**

1-2 class periods

**Objective(s):**

Students will

- define the terms “pest” and “pesticide”
- identify possible problems and health hazards pest organisms can cause
- discuss possible environmental and health hazards associated with pesticide use and exposure
- explain the basic principals and steps of integrated pest management (IPM)

**Assessment Opportunities:**

Provide students with a written greenhouse scenario or use the one provided at the end of this lesson. As students read the scenario, they are to imagine they are in charge of this greenhouse and must come up with what they would do to prevent and manage pests found in the greenhouse. Using the 6 steps of IPM and the pyramid of tactics, answer the following questions:

- What pests do you have? (If you aren't sure, how would you go about finding out what pests are present?)
- What would you want to learn about the possible pests?
- How would you find out how large the pest populations are? What monitoring techniques might you use?
- You've determined the pest populations are too high and something must be done. Explain different tactics you might use to prevent and manage the pests and why you chose those tactics. Use the pyramid as a guide, but generate your own ideas as well.
- How might you evaluate your results?

**Background:**

Rachel Carson, writer, scientist, and ecologist, grew up simply in the rural river town of Springdale, Pennsylvania. Her mother bequeathed to her a life-long love of nature and the living world that Rachel expressed first as a writer and later as a student of marine biology. Carson graduated from Pennsylvania College for Women (now Chatham University) in 1929, studied at the Woods Hole Marine Biological Laboratory, and received her MA in zoology from Johns Hopkins University in 1932.

She was hired by the U.S. Bureau of Fisheries to write radio scripts during the Depression and supplemented her income writing feature articles on natural history for the *Baltimore Sun*. She began a fifteen-year career in the federal service as a scientist and editor in 1936 and rose to become chief of all publications for the U. S. Fish and Wildlife Service. She wrote pamphlets on conservation and natural resources and edited scientific articles, but in her free time turned her government research into lyric prose, first as an article "Undersea" (1937, for the *Atlantic Monthly*), and then in a book, *Under the Sea-Wind* (1941). In 1952 she published her prize-winning study of the ocean, *The Sea Around Us*, which was followed by *The Edge of the Sea* in 1955. These books constituted a biography of the ocean and made Carson famous as a naturalist and science writer for the public. Carson resigned from government service in 1952 to devote herself to her writing.

She wrote several other articles designed to teach people about the wonder and beauty of the living world, including "Help Your Child to Wonder," (1956) and "Our Ever-Changing Shore" (1957), and planned another book on the ecology of life. Embedded within all of Carson's writing was the view that human beings were but one part of nature distinguished primarily by their power to alter it, in some cases irreversibly.

Disturbed by the profligate use of synthetic chemical pesticides after World War II, Carson reluctantly changed her focus in order to warn the public about the long-term effects of misusing pesticides. In *Silent Spring* (1962) she challenged the practices of agricultural scientists and the government, and called for a change in the way humankind viewed the natural world.

Carson was attacked by the chemical industry and some in government as an alarmist, but courageously spoke out to remind us that we are a vulnerable part of the natural world subject to the same damage as the rest of the ecosystem. Testifying before Congress in 1963, Carson called for new policies to protect human health and the environment.

Rachel Carson died in 1964 after a long battle against cancer. Her witness for the beauty and integrity of life continues to inspire new generations to protect the living world and all its creatures.

(The above biographical entry is courtesy of Carson biographer © Linda Lear, 1998, author of *Rachel Carson: Witness for Nature* (1997). [www.Rachelcarson.org](http://www.Rachelcarson.org).)

Rachel Carson paved the way for finding alternatives to using pesticides. Integrated Pest Management (IPM) focuses on pest prevention and using the least toxic methods when managing a pest problem. Pesticides may be a part of an IPM plan after other measures have been taken, but IPM emphasizes choosing the least toxic pesticide that will effectively manage the specific pest causing the problem at hand.

### **Getting Ready:**

1. Have a copy of Chapter 1 "A Fable for Tomorrow" from *Silent Spring* for students to read.
2. Review the brainstorm and discussion questions listed below. Make any changes or additions necessary before doing the activity.

### **Doing the Activity:**

1. As a class, brainstorm and create a list of common pests.
  - Discuss different scenarios in which these organisms are considered a pest. What do these situations have in common?
  - What kinds of problems and/or health issues are associated with or are caused by pest organisms?
  - When are these organisms not considered to be a pest? What do these situations have in common?

2. Using information from question 1, create a class definition of the word “pest.” Consider this statement: If there were no humans on earth, there would be no “pests.” Ask students to comment on the statement.
3. Have students work with a partner or in small groups to list different ways pests are managed (ex. sanitation, squishing, predators, pesticides, traps, exclusion, etc). Each group should report what they came up with and have one student keep a master list of everything mentioned by the class. (\*Note: most often some type of pesticide will be mentioned, such as insecticide, herbicide, or fungicide, but if no pesticide is listed, guide the discussion to include it). Ask students to define the term “pesticide.”
4. Silently to themselves, have students read Ch 1 “A Fable for Tomorrow” from Silent Spring. Possible discussion questions to answer individually or as a group include:
  - What pest was present in the town?
  - What was done to manage this pest?
  - What environmental problems arose from this management choice?
  - What human health problems arose from this management choice?
  - Were the various environmental and health problems caused by man or by nature?
  - By what means can pesticides harm the environment and human health? (ex. soil, water and air contamination, ingested by animals and humans, dermal contact, inhaled, etc)
5. Talk with students about the harmful effects of pesticides on the environment and human health. Refer to the Greenhouse Curriculum Introduction section of the lesson plans for information and resources. Discuss the laws in Pennsylvania addressing pesticide application notification in schools (including greenhouses) and about having an integrated pest management (IPM) plan for the school. Because pesticides cannot be used in the greenhouse while students are present, an IPM approach should be taken to manage any pest problems.
6. Introduce or review (depending on students’ prior knowledge) the 6 steps of IPM, including the pyramid of tactics. Refer to the Greenhouse Curriculum Introduction section of the lesson plans for information and resources. Using the pest management strategies they came up with earlier, ask students to identify where those tactics would fit on the IPM pyramid.
7. Pose several scenarios to the students about familiar pests (ex. ants in the kitchen in spring, a mouse in the house, etc.). Ask them to describe what they would do if this occurred in their home. Students are to follow the 6 steps of IPM and provide example tactics from several levels of the pyramid.
8. Instruct the students that they will be using the 6 steps of IPM to manage pest problems that occur in the greenhouse throughout the class as they grow crops. They will be using tactics from the bottom 3 levels of the pyramid as needed.

**Sample Scenario for Assessment Opportunity:**

The school greenhouse had not been used for several years before reopening last year. Last year, it was used intermittently with students. This year students are using the greenhouse to grow plants to sell as part of a class. The school year has already begun and some things were done to get the greenhouse ready. Most of the left over growing material and plants from last year has been removed except for the small pile in the far corner. There was only enough time to hose down the inside of the greenhouse with

water before the new transplants were brought inside. Although a work order was submitted to fix the hole in the screen and make sure the doors sealed, it doesn't appear anyone has fixed those yet.

The flower and vegetable transplants seem to be doing okay, but there are a few areas that look like they may be having problems. Several areas of plants are showing yellow and curled leaves. Upon closer inspection, aphids are seen on the underneath of many of the plant leaves. In addition, there are multiple flying insects in the greenhouse. There is one that lands on a leaf and appears to be white in color. Some plants have a few dead leaves, but it's unclear as to what may be causing them to die.

### **Enrichment Activities:**

1. 🐞 Research about Rachel Carson's life and her work to protect the eagles and peregrine falcons from the harmful effects of DDT. Investigate her influence on American culture and on public policy to protect the environment. Students can give a written or oral report on their findings and/or create a 3-D project illustrating Carson's environmental impacts that are still felt today.
2. Generate a poster to display pictures of the chemical pesticides no longer allowed within their school, and the IPM alternatives they have generated.

### **Reading Connection:**

Silent Spring by Rachel Carson

- Paperback: 400 pages
- Publisher: Mariner Books; Anv edition (October 22, 2002)
- ISBN-10: 0618249060
- ISBN-13: 978-0618249060