



***Dedicated
to Reducing
Pesticides***

Unit 4 Lesson 4: Six Bugs You'll Learn to Love

Focus Areas: Pest Identification, Pest Control, Environmental Science, Language Arts

Focus Skills: observation and experimentation, hypothesizing, predicting, drawing conclusions, making inferences, collecting and recording data, graphing data

Objectives

- To recognize that in many cases, insects provide benefits to humans rather than cause problems for humans
- To understand that some potential benefits of insects to humans have not yet been recognized
- To understand that humans must become more familiar with the insect world before destroying it

Essential Questions

- How do insects help humanity?
- Why are they given such a 'bad rap'?
- In what ways are humans destroying insect habitats?
- How do insects respond to sensory input in ways that might help humans?
- Why is Integrated Pest Management (IPM) an increasingly important strategy to use?

Essential Understandings

- Many insects help humans by pollinating plants, eating insect pests, decomposing waste, providing food for thousands of other creatures, and by being fascinating and beautiful in more ways than we can imagine.
- Some insects are responsible for spreading deadly diseases, damaging and destroying many varieties of food crops as well as flowers, biting humans and causing rashes and allergic reactions, and by being just plain annoying.



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- The destruction of wetlands, rainforests, and other habitats is severely affecting the survival of species of insects.
- Scientists are working to discover ways that insects can be harnessed to help humanity in such ways as sniffing explosives, providing ingredients for antibacterial drugs, and sensing radiation.
- Integrated Pest Management (IPM) methods help to reduce the indiscriminate use of pesticides that might harm insects that could be potentially beneficial to humans.
- Recognizing the unique beneficial aspects of insects helps us to appreciate the goals of IPM.

Background

While some insects like Jiminy Cricket and Flik, both bug movie stars, are appreciated, applauded, and loved, most insects are considered ugly and unlovable. “Bugs” have some serious image problems. With an estimated 10 quintillion, that’s **10** followed by **15** zeroes, on the planet Earth, there are sure to be one or two getting a “bad rap,” particularly during the summer months. Mosquitoes, bees, ants, and gnats can all ruin a lot of summer fun. However, scientists are working to discover ways that insect behaviors and abilities can be harnessed to actually help humans. Much of the research has been slow compared to what we know about plants and their medical uses. This is due to the fact that plants were used for as long as humans have been in existence. They were readily available as a source of nutrition and healing.

With advanced medical technologies, we are now able to have a far greater understanding of the amazing creatures called insects. For example, it is estimated that every insect carries 100 different chemicals in their bodies. Each could be studied extensively to determine if and how they might benefit humans. Scientists think that some hold great promise for the world. They are beginning to focus many experimentation efforts on learning more about insects.



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Vocabulary

degraded	polluted
herbal remedy	medicine made from herbs
infrared radiation	the process of emitting energy in the form of invisible wavelengths of light
land mines	pressure-sensitive bombs buried under the earth that kill or injure thousands of people
malaria	a tropical disease that kills 3 million people a year
mosquitoes	insects that may spread disease when females bite
scavengers	insects or other animals that eat decaying plant or animal matter
sensor	a device that responds to a physical stimulus such as heat, light, or motion and transmits an impulse for operating a control
vaccine	medicine that prevents humans and other animals from contracting certain diseases



Logistics

Time: two to three sessions of 30 to 45 minutes

Group size: 5 to 30

Space: a room with comfortable seating



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Materials

Handout 1 "Bug Biography Notes: Pest or Pal" *
Handout 2 "Six Bugs You'll Learn to Love" *
Bizarre Bugs by Doug Weschler *
Insect Picture Card Set *
Assessment with Answer Key *

* single copy provided



Preparation

1. Obtain the Insect Picture Card Set from the kit.
2. Obtain the book *Bizarre Bugs*.
3. Make copies of Handout 1, "Bug Biography Notes: Pest or Pal," one for each child.
4. Make copies of Handout 2, "Six Bugs You'll Learn to Love," one of the 6 different insects for each child.



Activity

Challenge: Profile a bug to love.

(Display for group viewing)

Introduction

1. Ask the children, "What's the first phrase or word that comes to your mind when you see this bug?" (Show the participants pictures from the book *Bizarre Bugs* and record the responses in two columns: **Positive** and **Negative**.)
2. Continue with the remaining pictures. Most of the responses will probably be negative. (Be sure to tell a little about the less known insects.)
3. Ask why humans are bothered by insects. Record the responses.
4. Using the background material from *Bizarre Bugs* and other sources, explain that scientists are studying insects and their



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behavior to determine how insects, although at times “pests”, may provide benefits to humans.

Involvement

1. Read aloud **or** have children read Handout 2, the biographies of the “Six Bugs You’ll Learn to Love.” (Originally appeared in the August 1-3, 2003 issue of USA WEEKEND. Reprinted with permission.)
2. Have the children complete Handout 1, “Bug Biography Notes: Pest or Pal” for each of the “bugs” or, groups of children could gather additional resources on one creature and present the information to the entire group.

Follow Up

1. Have participants create a play or skit to perform to educate others about the many benefits of insects.
2. Play the “Insect Card Game” found at:
iitc.tamu.edu/material/cardgame1.html

Follow Through

Experimenting With Insects

The following activity focuses on observing and predicting insect behavior resulting from various sensory inputs.



1. During one or two sessions, have children work in pairs or groups to design open-ended experiments about sensory stimuli to which insects might respond.
2. Ask the children what ideas they have regarding investigating insect responses. Light, sound, smell, and temperature differences are most commonly identified. Encourage different pairs or groups



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- to experiment different modalities. Encourage investigations of the same sense using different techniques.
3. The children could design a maze activity such as a Y or T maze. There are many suitable insects such as sow bugs, crickets, ants, ladybugs, or small beetles. WOW Bugs are available through many science suppliers such as Carolina Biological (www.carolina.com)
 4. Encourage children to calculate preference ratios, repeat their experimental design, and compare results with their peers.

Assessment

Have children complete the four Assessment questions. An Answer Key is provided.





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Notes





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