

Lesson 5 The Big Picture – IPM Discovered (evaluate & educate)

Introduction

Throughout the previous lessons students discovered the steps used in an integrated pest management plan, though they have not been formally introduced to the concept. They have independently discovered some organisms that can be considered pests, where these pests are found, what their habitats are, and how they live their lives. The students have learned the ideas of how to scout, monitor, make control decisions. This segment of lessons will put the concept of IPM into focus for the students.

Appropriate SC Science Standards for the Following Outlined lessons

Grade 2:

- I. Inquiry
A – Process Skills, 1a – Observe, 2a – Classify, 4a – Communicate
B – Inquiry, 1abd
- II. Life Science,
A – Characteristics of Organisms, 1a, 2ab
C – Organisms and their Environments, 1a

Grade 3:

- I. Inquiry
A – Process Skills, 1a – Observe, 2ab – Classify, 4a – Communicate, 5a – Infer, 6a – Predict
B – Inquiry, 1abcde
- II. Life Science,
A – Characteristics of Organisms, 1ab, 2a
C – Organisms and Their Environment, 2e

Grade 4:

- I. Inquiry
A – Process Skills, 1a – Observe, 2ab – Classify, 4a – Communicate, 5a – Infer, 6a – Predict
B – Inquiry 1 d e
- II. Life Science,
A – Characteristics of Organisms 1bc, 2abc
B – Organisms and Their Environment, 1b, 2, 3abcd

Grade 5:

- I. Inquiry
A – Process Skills, 1a – Observe, 2ab – Classify, 4a – Communicate, 6a - Predict
B – Inquiry, 1abcdef
- Life Science
B – Populations and Ecosystems, 1ab, 2ab, 4cde

Grade 6:

- I. Inquiry
A – Abilities to do Scientific Inquiry
1 – Identify process skills that can be used in scientific investigations, a1, b1, d1, e1
2 – Design and conduct a scientific investigation, bcgh

- 4 – Develop descriptions, explanations, predictions, and models using evidence, a
- 5 – Think critically and logically to make relationships between evidence and explanations
- 7 – Communicate scientific procedures and explanations, abcd

Grade 7:

- I. Inquiry
 - A – Abilities Necessary to do Scientific Inquiry
 - 1 – Identify process skills that can be used in scientific investigations, 1, 2; d1; e1
 - 2 – Design and conduct a scientific investigation, cgh
 - 4 – Develop descriptions, explanations, predictions, and models using evidence, ab
 - 5 – Think critically and logically to make relationships between evidence and explanations, a
 - 6 – Recognize and analyze alternative explanations and predictions, a
 - 7 – Communicate scientific procedures and explanations abcd
 - II. Life Science
 - B – Regulation and Behavior, 1ab, 3b

Resources for the following Activities

University of Florida

<http://ipm.ifas.ufl.edu/>

IPM institute of North America – IPM Super Sleuth

www.ipminstitute.org

Iowa State University

<http://www.ipm.iastate.edu/ipm/>

New York State Department of Law

<http://www.oag.state.ny.us/environment/ipm3fold.html>

Bio-Integral Resource Center

<http://www.birc.org/>

Michigan State University – Exploring Urban Integrated Pest Management

www.pested.msu.edu

Pennsylvania Schools IPM

<http://paipm.cas.psu.edu/schools/SchoolEduc.htm>

Duration 4 hours for all of the following lessons

Objectives

Students will:

- Learn the terms Integrated, Pest, and Management
- Learn the concept of Integrated Pest Management (IPM)
- Relate the steps of an IPM program to the activities they have done
- Evaluate their control practices
- Educate their peers and adults about IPM and preventative pest measures

Vocabulary

Integrated

Pest

Management

Evaluate

Educate

Prevention

Environment

Activity 1 – Discovering IPM

For grades 2-4 have students work in groups

For grades 5-7 have students work independently or in groups

Write Integrated Pest Management on your black board. Underline the letters I, P, and M. Divide your class into three groups. Give each group a word, either integrated, pest, or management. Ask each group to take a three-step approach in order to figure out what their group's word means.

1. Have each group member write their meaning of their word.
2. Allow each group to interview other classmates or teachers about the meaning of their word
3. Have each group look up the meaning of their word in the dictionary.

Ask each group to present their word to the class. After each group has presented their word, lead a class discussion about these words. Talk about each word and its meaning individually and then talk with the class about what IPM means when all of the words are put together in the phrase. Help students make the connection between the concept of IPM and what they have already practiced. Discuss the steps of an IPM program and see if they can match their activities with the steps. Have students work in their scouting groups again to complete the worksheet that will help them make the connections between the activities they have performed and the steps of an IPM program.

Steps in a successful IPM program:

1. Observe the pest or problem
2. Identify the pest and learn about its biology
3. Develop a monitoring program - scout and monitor for symptoms, signs, and quantities of pest populations

4. Make decisions about management options
5. Implement management strategies
6. Evaluate the management practices and educate about the pest and preventative measures

Once the students have completed their worksheets, ask them if there is anything left to do in their school and home IPM program. The students should realize they have not completed the last step of their program.

Materials

Paper

Pencils

Blackboard

Chalk

Paper/copies for worksheets

Dictionaries

Activity 2 – Evaluate

Ask students to reform their scouting groups. They will now re-scout their area of the school for their pest and fill out their scouting worksheet again. This time they will make specific notes about the management practices that were used and try to determine if these practices are working. Questions they should be thinking about:

- Are there symptoms and signs of the pest?
- Are there any pests? How many?
- Are there more or less symptoms and signs than previously observed?

Once students return from their scouting mission, ask them to compare their first scouting mission with the second. Talk about the differences they found. Have them present their findings to the class. Items they should tell the class:

- Explain again what management measure they used and why.
- Have them explain if they feel it worked or not and why.
- How could this pest problem be prevented?

Assessment

Have the students repeat this procedure for their pests found at home. They should return to school with notes about what they found.

Follow-up

Review with your students all of the steps of an IPM program be sure to match their activities with the IPM steps they have taken both in school and at home. Ask them why they think they have also done IPM at home. Help them understand that school and home are two different environments, but that people and pests are a part of both. Pests can be in similar environments, therefore it is important for us to take care of all of our surroundings.

Materials

Paper for worksheets
Paper
Pencils
Blackboard
Chalk

Activity 3 – Educate

Students should, once again, return to their scouting groups and begin preparing presentations. Assign each group a different pest, either one they have been studying at school or one they have been studying at home. Half of the class should talk about school pests, and the other about home pests. Allow your students class time to work on their presentations. They can present with posters, overheads, a puppet show, or any other creative measures.

Invite parents, administrative, custodial, and teaching staff to your class for a student taught IPM lesson. Allow your students to explain to your audience:

- What does IPM mean?
- What are the steps in IPM?
- How they have used IPM.
- What pests did they find?
- What did they learn about these pests?
- What kind of management options they used other than pesticides, and why?
- How they decided which options to use.
- Did their management tactics work?
- What everybody can do to prevent pest problems.
- Have the class explain what they have learned about IPM both in school and at home.

Activity 4 – Super Sleuth

The IPM Institute of North America (<http://www.ipminstitute.org>) has put together a variety of games and puzzles that address the concept and steps of an IPM program. At this point these games would help to cement your students' understanding of IPM. However, you may choose to use these helpful games and puzzles at any point during your IPM program.

Materials

Paper
Pencils
Construction paper
Markers
Colored pencils
Scissors
Glue
Overhead and transparencies

Name _____

Lesson 5 -Activity 1
Discovering IPM

Integrated Means: _____

A Pest Is: _____

Management Means: _____

Integrated Pest Management (IPM) is _____

Steps in a successful IPM program are:

1. Observe the pest or problem
2. Identify the pest and learn about its biology
3. Scout and Monitor for symptoms and signs of the pest
4. Make decisions about control
4. Implement control options
5. Evaluate the control practices and educate about the pest and preventative measures

What have you done that is associated with each step? (the way we have practiced these steps is...)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Name _____

Lesson 5 -Activity 2
Evaluate

| School Pests (drawing or description) | Pest Habitat (where it was found) | Pest Evidence (Symptoms and signs) | Pest Numbers | Monitoring (how often and when) | Management (when, how, with what) |
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Lesson 5

Corresponding Activity - 1

The Big Picture

Teacher Information Sheet - IPM defined

Integrated Pest Management (IPM) is a form of applied ecology. It uses, influences, and impacts the relationships of an ecosystem through biotic and abiotic means. IPM is a knowledge-based system that relies on correct and adequate information for decision making about management practices in both the present and future. Integrated Pest management integrates several compatible tactics for controlling pest populations through environmentally conscience and economical methods.

IPM does integrate the use of pesticides. They are often part of a successful program. However, the use of pesticides should be very specific for the situation that is being managed. Pesticides should only be used when necessary, and should target the major pest populations. Pesticides should not be harmful to beneficial organisms, and must be used in accordance with the label. It is necessary that individuals incorporating pesticides in their pest management program are knowledgeable about their use and safety. A successful IPM program uses additional methods to control pest problems and uses only those pesticides that are compatible with other management strategies. IPM programs aim to reduce the use and reliance on pesticides, and this program includes a series of steps.

Step One: Organisms in the situation are correctly identified. Then determine if the organism is a major pest, a minor pest, or a beneficial organism. If it is a minor pest, it may not be necessary to take further action. Likewise, if it is a beneficial organism, no action is necessary.

Step Two: Learn more about the pest. Identify the pest as the cause of a problem; research the pest and its biology. Know its life cycle and developmental habits, its behavioral and feeding habits, and understand its distribution, and potential damage to the resource.

Step Three: Establish a monitoring program. This is done through scouting and monitoring procedures. Determine the levels at which pest populations will cause severe loss either through yield, aesthetics, or monetary value.

Step Four: Make decisions about tactics that can be implemented in the situation. Which tactics are most available, effective, efficient, and cost beneficial to the situation? It is important at this step to think about how management strategies will influence the ecosystem to be managed. Examine all of the alternatives and choose the best option(s).

Step Five: Implement the tactics chosen to manage the pest situation. Then continue to monitor the pest population with respect to the chosen tactic. Are the tactics working? Or does the situation need to be reevaluated and new tactics implemented? Was a decision really necessary? Was the population high enough to cause severe problems?

Step Six: Continue to evaluate the monitoring program and chosen management tactics. Consider if changes are needed in the monitoring program or management tactics. Then educate individuals about IPM programs that were implemented. This can be considered a preventative measure to ensure against pests in the future. Taking preventative measures against pests can be the easiest and most effective pest management tactic.

Sources:

Norris, Robert F., Edward P. Caswell-Chen, and Marcos Kogan. Concepts in Integrated Pest Management. Pearson Education, Inc. Upper Saddle River: New Jersey 2003

University of California IPM online

<http://www.ipm.ucdavis.edu/>

Cooperative State Research, Education, and Extension Service

<http://www.csrees.usda.gov/>

IPM Institute

<http://www.ipminstitute.org>

Integrated Plant Protection Center – Directory of IPM Resources

<http://www.ippc.orst.edu/DIR/>