

Lesson 6 Extension

Lesson 6



CONSUMER CHOICE — PEST INVESTIGATION FOR SECONDARY STUDENTS

This lesson is an additional activity for Lesson 6 of the 6th–12th Grade version of the *Hazards on the Homefront: A Teaches Guide to Household Hazardous Waste*.

Grade levels 6-12

Multiple intelligences

Interpersonal, intrapersonal, logical/mathematical, naturalist, verbal/linguistic

Duration

One 60-minute investigation

Vocabulary

Chemical controls, integrated pest management (IPM), pest, pesticide, physical controls, repellent

Materials

- Rubber cockroach or other fake insect, or a paper silhouette or student drawing of an insect
- Slide
 - 6.1. Guidelines for a Successful Integrated Pest Management Plan
- Student handouts
 - Case Files
 - Case 1 --Something is eating our vegetables!
 - Case 2 --Flying bugs in my kitchen!
 - Case 3 --The playground is not fun!
 - Case 4 --Hey, that's my candy!
 - Case 5 --I'm getting eaten alive in my backyard!
 - Investigate Your Own Case
 - Case Solved Worksheet
 - Pest Investigation Notepad
 - Usual Suspect Cards
 - Fruit Fly
 - Slug
 - Yellowjacket
 - House Ant
 - Mosquito
 - Other (to be researched)
- Pest Management Plan Rubric

Resources

- Gardening in Western WA - gardening.wsu.edu
- Gardening in Eastern WA - spokane-county.wsu.edu/spokane/eastside
- "Good Bug" Guide - lhwmp.org/home/ChemToxPesticides/goodbug.aspx
- Grow Smart, Grow Safe: A consumer guide to lawn and garden products - lhwmp.org/home/ChemToxPesticides/growsmartgrowsafe.aspx
- Pestsense - pep.wsu.edu/pestsense
- UPEST - ecy.wa.gov/programs/swfa/upest
- More IPM Fun for Kids - ipminstitute.org/Super_Sleuth/Resources/homework_resources_kids.htm
- Northwest Native Plant Guide - <http://green.kingcounty.gov/gonative>

Washington State EALRs

Environmental and Sustainability Education
Health and Fitness
Reading
Science

Lesson 6



Learning Objectives

Students will learn about integrated pest management and how to safely and appropriately address a common pest problem through research, critical thinking, and problem-solving skills.

Summary of Lesson

Working in groups, students organize as a pest control agency to identify and solve one of several pest problems presented or research a problem of their choice.

Background

While the danger of hazardous chemicals to the health of adults is great, the threat to children can be even greater. More than fifty percent of reported poisonings involve children six and younger. Children take in and absorb more food, air, and water in proportion to their body weight than adults do, so exposure to pesticides will affect children more readily. Children tend to breathe more through their mouths, allowing more particles to get into the lungs than when filtered through the nose. Young children also transfer many substances from their hands into their mouths. Children's immune systems are less developed and less capable of handling hazardous chemicals. Since their brains and other parts of their nervous systems are still developing, even small amounts of hazardous substances that affect the nervous system can damage their development.

People use synthetic and natural pesticides — insecticides and herbicides— for all sorts of reasons. They use them to get rid of pests (such as

ants), to make their lawns look healthy, or to help their gardens or farms produce lots of flowers or food. However, lawn and garden products may be some of the most hazardous products in the home. Products that kill insects, weeds and fungal diseases may also be toxic to children, pets, birds, fish, and beneficial insects such as bees and ladybugs. In addition, pesticides used on home landscapes may be carried inside the home on clothing and shoes. Inside, pesticides can lodge in house dust, where they may be inhaled or ingested by young children.

Some lawn and garden products can create more far-reaching problems. They get into the air, soil, and water supplies, and end up affecting human health and wildlife in unforeseen ways. For example, the U.S. Geological Survey found 23 insect- and weed-killers in streams tested in the Puget Sound region, with more pesticides found in urban than in rural areas. Overuse of pesticides —widespread use and in quantities larger than necessary to get the job done —has produced new strains of pests resistant to their effects.

Integrated pest management is a process in which we learn about our pests and select the best control methods to manage them with the least effect on people, pets, and the environment. Long-term results can be achieved by anticipating and preventing pest activity and combining several pest control methods, starting with physical controls. With integrated pest management, chemical controls are used only when needed and in the least-toxic formulation that is effective against the specific pest.

Lesson 6**INVESTIGATION****Pest Investigators****ENTRY POINT**

Ask students to consider what they would do if ants were discovered on the kitchen counter at home. Should a chemical that is known to be toxic to humans and other animals be used to kill the ants? What else could be done to prevent the ants from entering the kitchen? When does a pest become a pest problem? Ask students to describe what they do at home when a pest problem arises.

FOCUSING QUESTION

How can a pest problem at home be effectively managed with the least effect on people, pets, and the environment?

DIRECTIONS

1. Inform students that they will be acting as investigators at a pest control business in order to solve a pest problem. Pair students together or allow them to choose their own partners to form a pest control agency. Each pair of students can take a minute to come up with a name for their business.
2. Introduce the activity by explaining that each pest control agency will take a case from a client with a pest problem. In order to solve the problem, the pest investigators will design an integrated pest management plan.
3. Introduce the concept of integrated pest management by showing Slide 6.1 Guidelines for a Successful Integrated Pest Management Plan and explain that an integrated pest management plan is a recommendation for how to solve a pest problem. It is similar to a doctor's advice to a patient. The advice may consist of multiple strategies such as rest, changes in diet, and medicine.

4. Assign or have students select a case from one of the case files or ask students to create their own case using the Investigate Your Own Case handout. Explain to students that a case file contains information collected from the client with the pest problem. Students creating their own cases can interview a parent, neighbor, school groundskeeper or other person to develop their case. This information is the evidence that each pest control agency will use to identify the suspected culprit and recommend how to fix the problem.
5. After student groups have had a chance to read or develop their case file, instruct them to browse through the Usual Suspect Cards and choose the pest that best fits the evidence from the case file. Students that have created their own case can research information about their suspected pest, using the "other" suspect form to fill in the needed information.
6. Students will then collect and record information from the Case File and the Usual Suspect card on their Pest Investigation Sheet.
7. Using the guidelines for a successful integrated pest management plan, student teams will design an integrated pest management plan for their client. Have students write one to two paragraphs that is their best work. They could also provide this information in the form of a poster.
8. After completing their integrated pest management plan for the client, students will each separately answer questions on the Case Solved worksheet.
9. Discuss with students the results of their investigations. Ask them to compare their solutions with or present their findings to the rest of the class.

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DISCUSSION QUESTIONS

1. What are some effective ways of discouraging pests?
Using physical controls that prevent pests from entering the garden or house in the first place. Getting rid of food, water, and shelter for the pests by cleaning up the area. Dealing with the source of the problem by growing the right kind of plants in the garden — ones resistant to pests.
2. When would you recommend using a pesticide? When would you avoid its use?
When a pest problem becomes serious enough to cause harm and physical controls don't work, some people might want to use a pesticide. It is important to select a pesticide that is safe to use in the situation. For example, some pesticides are for outdoor use only or should not be used in areas where there are children.
3. What can we do to reduce the amount of pesticides that we use?
Research the problem before using pesticides to determine the best approach to solving it. Identify solutions that do not require the use of pesticides. Make sure the problem is serious enough to warrant the use of pesticides. Don't use combination products that target more than one type of pest — for instance, insects and fungus.
4. Why is it important to buy only the amount of a pesticide or household hazardous product that you need? Why not buy extra?
If you buy only what you need, then you won't have leftover hazardous materials that need to be disposed at a hazardous waste facility. Often these leftover products sit in a cupboard, basement, or garage where they could deteriorate, be a hazard in a fire or flood, or be accessible to children. Poisoning is the fifth leading cause of accidental death in children under the age of six, and is one of the most common reasons children are seen in emergency rooms.

ASSESSMENT

Student participation and work can be assessed in a number of different ways throughout this lesson. The Pest Investigation Notepad is a record of how students analyzed the facts from the Case File and Usual Suspect cards. The pest management plan shows how students synthesized the multiple forms of information and designed a solution to the problem. The Case Solved! worksheet offers a perspective on how the student engaged in the process.

REFLECTION PROMPTS

1. The easiest part of this assignment...
2. The hardest part...
3. I learned...
4. I plan to...

ENRICHMENT AND EXTENSIONS

1. Have students share their integrated pest management plans to the entire class through a presentation using PowerPoint or another media presentation tool.
2. Students can suggest additional pest problems that they may be experiencing at home or at school. The class can work together to design an integrated pest management plan.
3. Using the students' research, put together a guide to pests and beneficial insects, and distribute it to families.
4. Have students research the biology and ecology of a pest in the Pacific Northwest and write a six-paragraph essay on the theme of the good, bad, and neutral.
5. Research pesticide use at your school or in your community. Write a persuasive letter to the appropriate person supporting or opposing the current practice.
6. Research native and other environmentally friendly plants that minimize use of pesticides.
7. Invite a pest control technician to come to your classroom to talk about required expertise for such a career.

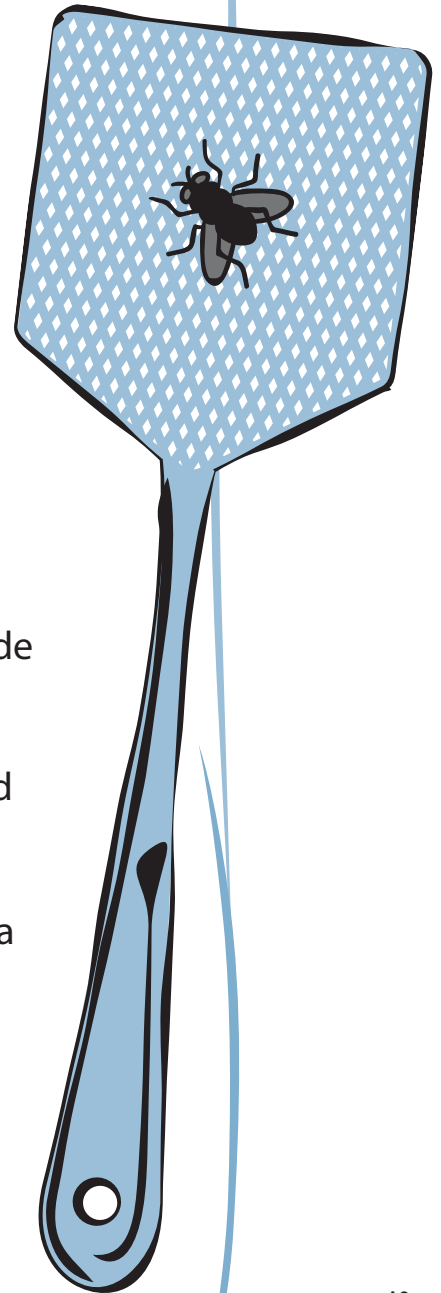
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Guidelines For A Successful Integrated Pest Management (IPM) Plan

A good integrated pest management plan includes the following:

- Problem – Describes exactly what is happening and whether it is a problem.
- Pest Identification – Names the pest that is the problem and explains how the evidence supports this.
- Goals – Describes what a good solution would look like.
 1. Prevention
 2. Physical and non-toxic controls
 3. Assessment of which is worse — the pest or the pesticide
 4. Selection of a pesticide, if necessary
- Strategy – Gives instructions on how to meet the goals and solve the problem. Note that all good pest management plans include monitoring the situation and assessing each step in the solution to see if it works before moving on to a more hazardous step.
- Follow-up – Explains how to keep the problem from happening again.



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CASE FILES

Case #1 - Something is eating our vegetables!

The local community garden coordinator has come to you for help. They recently planted a vegetable garden in a corner of the schoolyard and are growing lettuce, spinach, radishes, carrots, and tomatoes. Their garden is located between some small bushes and a pile of wood scraps leftover from building a fence. All of the plants seem to be growing, but something is eating the spinach and lettuce leaves. One gardener reported that yesterday morning she found a trail of slime next to one of the lettuce plants.

The community gardeners would like you to solve this mystery and stop their lettuce and spinach from disappearing. They plan on using the vegetables from their garden to support the local food bank and do not want to use anything that might poison their food. Best of luck. This suspect is slimy!



CASE FILES

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Case #2 - Bugs in my kitchen!

Your teacher has come to your pest control agency with an emergency. She was about to prepare several pies for the end-of-the-year party when she noticed about a dozen tiny, flying bugs circling above the countertop in her kitchen. When she reached for a peach, a swarm of these tiny insects rose above the fruit bowl. Your teacher also noticed more of the same flying insects near her recycling and food waste bins.

Your investigative skills are needed to solve this case and save the end-of-the-year party. None of the flying insects have stung or bitten your teacher, but they sure are annoying. Help your teacher reduce the number of these pests without adding harmful chemicals to the ingredients for the pies. Good luck. Your classmates are counting on you!



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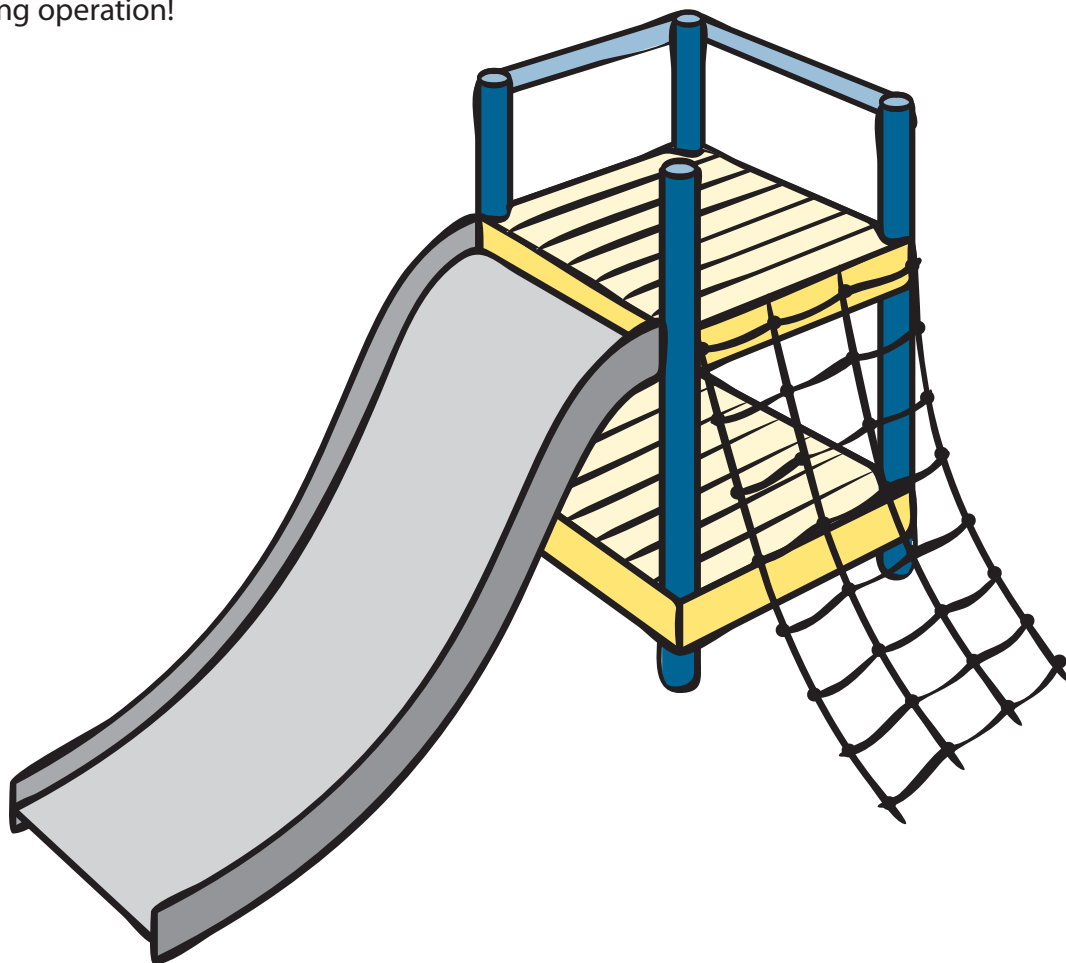


CASE FILES

Case #3 - The playground is not fun!

On a late summer afternoon, several upset kids burst into your pest control office looking for help. One of them was crying because he was stung by a flying insect while climbing on the playground structure at a nearby park. Others in the group explained that they have seen more and more of these pests the last few days, especially during snack times. The kids also tell you that the insects are yellow and black, and can often be found near the trash can close to the play structure. One girl said that she often sees them flying in and out of a crack in the wall of the park bathroom.

Use your pest investigative skills and help these kids feel safe again while playing at the park. Keep in mind that many kids play at this park, and some of them are babies who like to crawl around in the grass. Good luck. It is now your turn to put together a sting operation!



CASE FILES

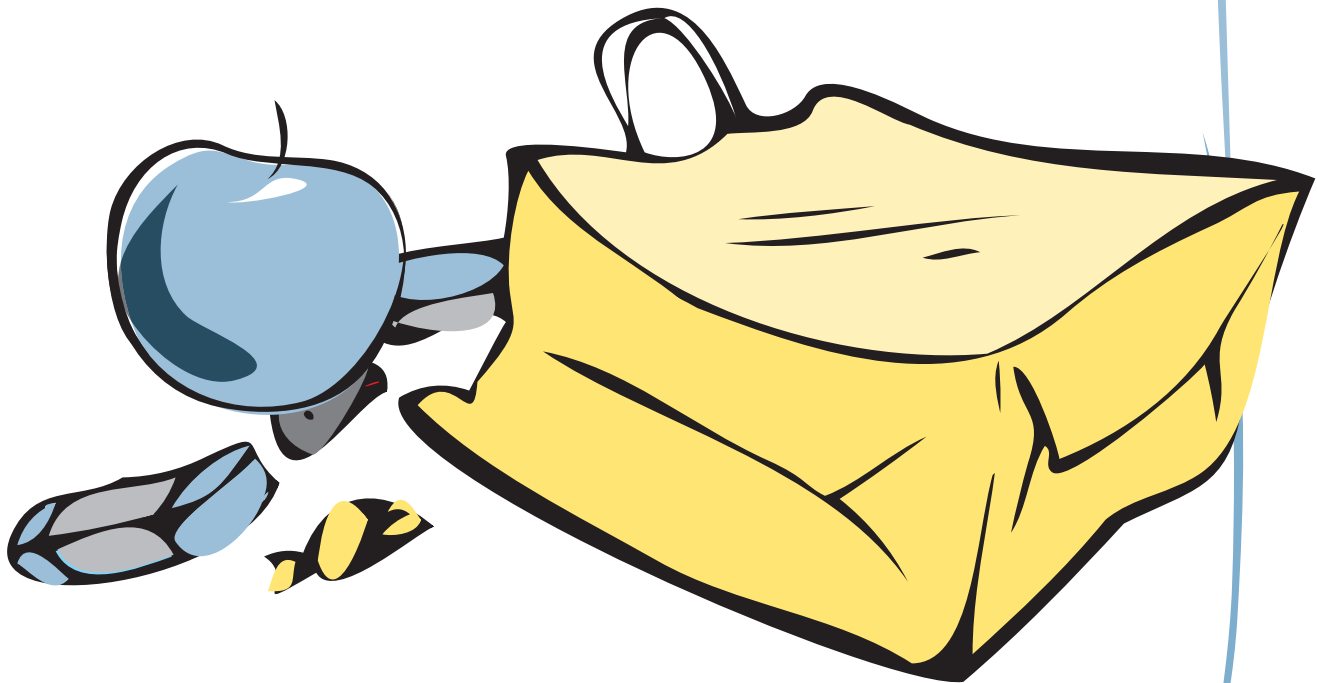
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Case #4 - Hey, that's my candy!

Just before closing time, a little girl and her brother enter your pest control agency. The girl is very upset because she discovered several small bugs inside a bag of Halloween candy she had been saving under her bed. Her brother thinks they are a kind of insect since they have six legs. He has seen more of the same bugs crawling in a single-file line on the floor beneath their bedroom window and outside of the house along the foundation.

The brother and sister are worried that their other bag of Halloween candy that is hidden in a bedroom closet might be in danger of being infested by these pests. They need your help in coming up with a way to stop the bugs from entering their bedroom and getting to their candy. They have offered five pieces of candy as payment if you are successful. Good luck!



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CASE FILES

Case #5 - I'm getting eaten alive in my backyard!

A local teen has come to your pest control agency for some advice. Her younger sister and brother want to play in their kiddie pool on the long summer evenings and pour water in and out of buckets and other water toys. But they are getting covered in bites. The same thing happens to the rest of the family when they sit outside to watch the sun set. Small flying insects buzz around and land on their bare skin before biting. It's definitely more of a problem in the evening than in the middle of the day, but sometimes it's just too hot to stay indoors! What suggestions can you give them so they can keep their cool?



CASE FILES

Investigate Your Own Case

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Describe the problem.

Can you identify the suspect? Can you see the pest or just the damage? What are some identifying characteristics that will help you identify the pest?

Where is the pest problem? If there is a plant affected, be specific about the type. Describe the location of the damage by the pest. Identify, if possible, what is attracting the pest to the location.

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The Usual Suspects

Usual Suspect - Fruit Fly

Characteristics and Behavior

- This flying insect is about 2.5 millimeters long, yellow-brown in color, with brick-red eyes, and usually black rings across its abdomen.
- Fruit flies can exist in your home year-round, but they are especially common when the weather outside warms during late spring through the fall.
- They are attracted to ripe or rotting fruits and vegetables.
- Fruit flies can enter your home when they are adults by flying through open windows, or as eggs or larvae on the surface of fruits and vegetables from the grocery store or your garden.
- Once inside your home, female fruit flies will lay eggs on ripened fruit and vegetables, inside kitchen drains and garbage disposals, empty bottles and cans, and trash bins. Female fruit flies have the ability to lay as many as 500 eggs before they die, and their entire life cycle from egg to adult can be completed in about one week!
- Fruit flies do not sting or bite and are mostly an annoyance to people.



Prevent

- Remove items that attract fruit flies. Do not leave ripe fruit or vegetables out on the kitchen counter. Refrigerate ripe food that you cannot eat immediately.
- Clean up immediately after preparing a snack or meal. Keep countertops and other food surfaces clean.
- Clean up spills when they happen.
- If you keep food waste and recycle bins inside your home, be sure to empty and wash them frequently.

Observe

- Take action as soon as you notice fruit flies in your kitchen.
- Find what is attracting them by noting the area where fruit flies are hovering.

Manage

Physical Control

- Remove all potential sources of attraction.
- Clean surfaces that commonly come in contact with food.
- Capture adult fruit flies by building a simple trap. Place a paper funnel (rolled from a sheet of notebook paper) into a jar or bottle that has a few ounces of cider vinegar or a small piece of ripe banana at the bottom.

Chemical Control

- An insecticide with the active ingredient pyrethrum will kill fruit flies on contact. However, chemical controls are rarely needed for control of fruit flies, since they are only an annoyance and not a health risk. Insecticides with pyrethrum should be used with caution. Inhaling high levels of pyrethrum may induce asthmatic breathing, sneezing, nasal stuffiness, headache, nausea, tremors, convulsions, and burning and itching sensations. Infants and children are especially vulnerable. Pyrethrum is extremely toxic to aquatic life.

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Usual Suspect - Slug

Characteristics and Behavior

- Slugs are a type of mollusk, like clams, squid, and octopuses.
- They thrive in moist, shady areas.
- Similar to snails, slugs secrete a slimy mucus trail on which they glide along.
- They hide during the day and are active at night and on early, damp mornings when they come out to feed.
- Slugs like to hide in cool places. They can often be found under plant leaves, loose boards, and garden pots.
- Slugs can eat 30 to 40 times their weight every day.
- They prefer to eat some plants more than others. For example, they prefer spinach and lettuce leaves to geraniums or lavender.



Prevent

- Get rid of hiding places.
- Choose plants that slugs do not like and plant them around the edge of your garden to keep slugs away. Slugs are less likely to eat garlic, mint, chives, sage, red lettuce, red cabbage, and fennel.
- Keep slugs away from their favorite plants by creating a barrier. Plastic or copper collars around young plants can keep slugs from reaching the plant. Copper tape or strips around a planting bed can also work.
- Keep the garden dry. Water in the morning, using soaker hoses rather than overhead sprinklers.

Observe

- Control slug problems by catching them early. Take action at the first sign of damage.
- Walk through your garden and keep track of plants slugs like.

Manage

Physical Control

- Handpick slugs and drop them in a jar of soapy water.
- In the fall, look for and destroy pearly clusters of eggs.
- Use simple traps. Flower pots turned upside down or boards raised an inch off the ground make good traps. Check under these traps daily and remove any slugs. Empty rinds of grapefruit halves or melon turned upside down near the plants you are trying to protect also make good traps. Beer or apple cider traps can be effective, but must be covered to keep out rain and refilled every few days.

Chemical Control

- Slug bait with iron-phosphate can be used. Iron-phosphate is safe to use around children, pets, birds, and other wildlife. However, baits alone will not be enough to control slugs.
- Slug baits with metaldehyde or carbaryl kill slugs on contact. Metaldehyde is poisonous to dogs and cats. Carbaryl is toxic to fish and beneficial insects such as bees.

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Usual Suspect - Yellowjacket

Characteristics and Behavior

- Yellowjackets are a type of wasp.
- They are about 12 millimeters long and are striped with black and yellow.
- They are mostly active during the late summer and fall.
- Yellowjackets can be aggressive and will occasionally sting.
- Yellowjackets build their nests in wall cracks, attic spaces, rotting logs, under overhangs, beneath decks, and underground.
- Most yellowjackets are both scavengers and predators, and will eat a variety of different insects they catch as well as human food found outside.



Prevent

- Seal cracks and openings in buildings, and remove wood debris and stumps to eliminate opportunities for yellowjackets to build their nests.
- Do not provide a food source for yellowjackets; keep food waste and garbage bins covered outside.
- Do not wear clothes that are yellow or have floral patterns during peak seasons.
- Move trash cans and other sources of attraction away from the immediate areas where people play, relax, and work.
- Avoid areas where yellowjacket nests exist.

Observe

- Control yellowjacket problems by noticing them early. Take action at the first sign of nest building.
- Yellowjackets that are flying directly in and out of a single location are probably flying to and from their nest.

Manage

Physical Control

- Do not swat or try to catch them.
- If a nest must be removed because it is attached to your home or other place frequently visited by humans, call a professional to do the work.
- Purchase or make traps that use a protein bait, such as fish or lunchmeat, to capture yellowjackets. These can be used to lure yellowjackets away from areas frequented by people.

Chemical Control

- Nest sprays can be effective, but must be used with extreme caution. Yellowjackets are known to attack a person trying to spray their nest. While some nest sprays use non-toxic ingredients such as mint oil, others contain potent neurotoxins that have acute effects on birds and fish, and chronic effects on humans.

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Usual Suspect – House Ant

Characteristics and Behavior

- House ants are very small insects, usually not more than 1.5 millimeters long.
- They are either brown or black in color.
- These insects are frequently on the move, searching for food and are often seen traveling in a line to and from a food source.
- They feed on a wide variety of things, including nectar, living or dead insects, dairy products, fruit juices, and sweets.
- Ants are social insects and live in colonies underground or within natural cavities or man-made ones such as walls.



Prevent

- Keep kitchen and other rooms as free of exposed food and crumbs as possible.
- Thoroughly clean areas where food is prepared on a daily basis.
- Food that is not stored in the refrigerator or freezer should be put in tightly sealed containers.
- Seal entryways to ants by filling cracks and crevices with silicone caulk. Seal around baseboards, moldings, cupboards, pipes, ducts, sinks, toilets, and electrical outlets.

Observe

- When you notice ants in your home, take action.
- Determine the location of their nest by following a trail of ants back to their home.

Manage

Physical Control

- If the nest is found outdoors, pour large amounts of boiling water directly into the nest to destroy it.
- If the nest is found indoors, use a vacuum to remove the ants. Clean the trail you followed with soapy water so ants can't find their way back to your kitchen.

Chemical Control

- A bait trap can be used to capture ants. Propoxur is the active chemical ingredient most commonly used in bait traps to attract and kill ants. Children, domestic pets, and wildlife are at risk of poisoning if they eat propoxur. It is important to place traps out of reach of children, pets, and wildlife.

Lesson 6**Usual Suspect - Mosquito****Characteristics and Behavior**

- Mosquitoes are small, flying insects.
- Mosquitoes go through four stages in their life-cycle: egg, larva, pupa, and adult.
- Adult females lay their eggs on the surface of still water, which can be a lake, a puddle, a natural reservoir on a plant, or an artificial water container such as a plastic bucket or swimming pool.
- The adult mosquito emerges from the pupa as it floats at the water surface.
- Adults live for 4–8 weeks.
- Many species are capable of drinking blood from many types of mammals, including humans, and are known to spread disease-causing viruses and parasites.
- Only female mosquitoes bite. They are attracted to heat, light, perspiration, body odor, lactic acid, and carbon dioxide.

**Prevent**

- Eliminate mosquito breeding locations by removing buckets or other items such as old tires that collect standing water. Make sure that roof gutters aren't clogged and collecting water. Put screens over rain barrels.
- Use window screens on all of your windows to prevent mosquitoes from entering your home.

Observe

- Mosquitoes don't fly very far, so those that bite you originated nearby, perhaps on your property. Locate and eliminate potential breeding locations. Note the time of day the mosquitoes are a problem. If they are inside the house, determine how they are getting in.

Manage*Physical Control*

- Change water in bird baths or other standing water at least twice a week.
- Pick up or dump collected water after it rains.
- Wear protective clothing that covers most of your body.
- Use fly swatters.
- Keep doors closed at dusk or dawn when mosquitoes are most frequent.

Chemical Control

- Insecticides can be used to kill larvae and adults. Most chemical controls are also highly toxic to beneficial insects, birds, and fish, including those that eat mosquitoes. The chemicals used include organophosphates such as malathion or naled and several synthetic pyrethroids. All of these chemicals kill via the nervous system and, in high enough doses, can also affect humans, especially children.
- Repellants don't kill mosquitoes, but can help prevent them from biting. Many popular mosquito repellents contain DEET, generally considered safe. The lowest concentration that is effective (10% or less for children ages 2-12) is recommended and should be applied only to exposed skin and washed off after use. Some products with high concentrations of DEET have been associated with adverse health effects. Newer products contain picaridin, a synthetic chemical of low toxicity. Products with soybean, citronella, lemon, and eucalyptus oils are available as well and are considered non-toxic.
- Citronella candles, torches or coils can be burned to produce a vapor that repels mosquitoes, but are only useful when the wind isn't blowing.

Biological Control

- Frogs, toads, dragonflies, hummingbirds, and bats all eat mosquitoes. Fish are one of the most effective controls for backyard ponds.
- *Bacillus thuringiensis israelensis* (Bti), a selective insecticide derived from naturally occurring bacteria, kill the larvae when added to small ponds. It is available for household use in small quantities marked under the name "Mosquito Dunks" or "Mosquito Bits" and is effective for about a month.

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Usual Suspect - Other

Name of Insect _____

Characteristics and Behavior

What are some important characteristics or behaviors about this pest that will help identify appropriate strategies to eliminate or control the problem. For example, what kind of habitat does it require?



Observe

What conditions should be observed to determine the extent of the problem? The source of the problem, such as how it's getting inside?

Manage

What types of controls exist to eliminate or reduce the problem?

Physical Controls

Chemical Controls

Prevent

What can I do to prevent this from being a problem?

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Pest Investigation Notepad

- Problem – In your own words, describe the pest problem.

- Pest Identification – Based on the Case File, who do you think the suspect is?

- Observation – What evidence from the Case File supports the suspect you are accusing?

- Goals – What does a successful solution look like? How will it solve the problem so that the client will be happy?

- Prevention – What steps can the client take to prevent the pest problem from happening in the first place?

- Strategy – List the physical and chemical options for solving the pest problem. What are the potential problems associated with using a chemical option?

- Follow-up – How can the problem be monitored so that the problem does not happen again?



Case Solved!

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Now that you have brilliantly solved the case, take a moment to think about how well you considered the evidence and created a management plan that met the goals of your client.

- What was important to keep in mind when you designed your pest management plan?

- Circle the strategy you used: physical or chemical. What were your reasons for that choice?

- What do you think the client can do so that the problem does not happen again?

- Is there any other information that might have been useful to you as a pest technician?

Pest Management Plan Rubric

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Component	0 Does not meet	1 Partially meets	2 Meets	3 Exceeds	Total
Writing mechanics	Writing is extremely limited in communicating knowledge.	Writing is limited in communicating knowledge.	Writing is purposeful and focused. Piece contains details.	Writing is confident and clearly focused with relevant details.	
Problem identification	Problem is not identified.	Problem is partially identified.	Problem is identified.	Problem is identified with details.	
Evidence matched with pest	No evidence is given.	Some evidence, but not connected with pest.	Evidence is connected with pest.	Evidence is connected to pest with reasons.	
Goals for solution	No goals are given.	Some goals are given, but not all client needs are met.	Goals are given that meet all the client needs.	Goals are given with explanation of how they meet client needs.	
Strategy for solution	No strategy is given.	Strategy is given that partially meets client needs.	Strategy is given that meets client needs.	A detailed strategy is given that considers all client needs.	
Follow-up	No follow-up is given.	Some follow-up is given.	A complete follow-up plan is given.	A detailed follow-up with possible troubleshooting is given.	
				Total	