

WANTED DEAD OR ALIVE

An Integrated Pest Management Lesson

Karen Vail, Professor and Extension Urban Entomologist, Department of Entomology and Plant Pathology



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Skill Level

- Beginner, Intermediate

Learner Outcomes

The learner will be able to:

- *Summarize the basic needs of insect pests*
- *Learn to identify common indoor pests*

Tag(s)

4-H Science

Success Indicator

Students are successful if they can:

- *Identify common indoor pests.*
- *Apply the knowledge to create wanted posters.*

Time Needed – 30-90 minutes

Materials Needed

- *“All About Pests” worksheets (one per student)*
- *Wanted poster worksheets or blank posterboard*
- *Markers or pencils*

Author(s)

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Introduction to Content

Correct identification of a pest is important. Knowing that it is a bug is not enough. Since different species have different habits and preferences, knowing the exact identification will aid in the management process. Once a pest is identified, read about its life cycle, food sources, preferred habitats, special skills and natural enemies. The best management plan will take all of these factors into account.

Introduction to Methodology

By creating wanted posters, the students learn how to identify these pests and their basic needs. This activity can be done by individual students or in groups. You can photocopy the blank wanted poster worksheet or have the students create their own posters from scratch.

Setting the Stage

On the board write, “Wanted,” with a big question mark. Say, *“I have a problem. I want everyone in the school to help us be on the lookout for pests. What things do they need to know?”* Take suggestions from the class. Answers should include the name, a description or what it looks like, signs that it has been there or what it might leave behind when it isn’t there (droppings, damage), and where to look for it. Then say, *“Today we are going to make wanted posters for pests.”*

By developing wanted posters, the students will learn about basic needs (food, water and shelter), and identification characteristics of common pests as well as signs of these pests. The wanted poster will assist the student in completing the first two steps in an integrated pest management (IPM) program: (1) inspect and investigate and (2) identify and learn. For an in-depth explanation of the steps to school IPM, see https://www.canr.msu.edu/ipm/schools-community/schools/elementary_urban_ipm_curriculum

Experience

Assign each student or group a pest to read about. Give the student/group the “All about Pests” sheet on the assigned pest. You may also decide to read the descriptions aloud as a class.

Strategies to Increase Student Engagement

- Be sure that all students have an opportunity to answer questions.
- Make the lesson hands-on as much as possible.

Teacher Notes

Ask the students to complete the wanted poster using the information they read. Use the blank wanted poster sheets or make posters from scratch.

Share/Process

Each student/group can present their poster to the class. Since the students read about different pests, this is the opportunity for the students to learn about all the pests.

Discuss what they learned about each pest.

Name three characteristics you can use to identify your pest.

What are three things that your pest likes to eat?

Name three locations (inside) that you can find this pest.

Name one other interesting fact about this pest that you didn't know before.

Generalize

Why do schools have pests? What food, water and harborage is found in this environment that supports these pests? Hang the posters around the school.

Apply

Ask, "*Why aren't all pests managed the same way? How do you and your family manage pests in your home?*"

References

Jenkins, Erica B. "Exploring Urban Integrated Pest Management: Activities and Resources for Teaching K-6." October 2001, Michigan State University.

TIPPS Life Skills

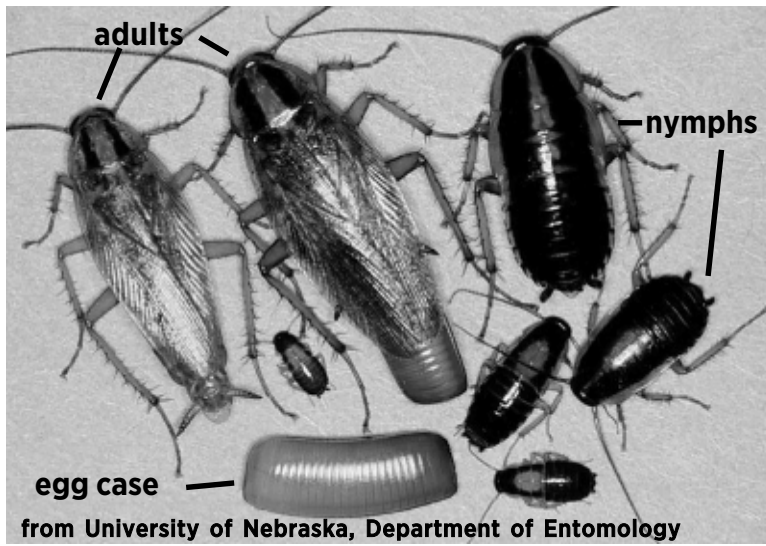
4th Grade

- Follow instructions. (Heart)

5th Grade

- As part of a group, identify and agree on a common task (set a goal). (Hands)

All About the German Cockroach



from University of Nebraska, Department of Entomology

What It Looks Like

Like all insects, they have six legs, three body parts and two antennae. The adults have wings, and are brown with two black stripes on their thorax (behind the head). Cockroaches do not go through complete metamorphosis. Their young look similar to the adults but do not have wings. These young are called nymphs. The adults can grow as big as 5/8 inch, and the nymphs can be as small as a poppy seed. Eggs are kept in a hard case that the female carries with her until they hatch. German cockroaches are fast runners.

Why it's a Pest

The German cockroach is the most common cockroach found inside houses. They contaminate food and surfaces in the kitchen or bathroom and leave behind droppings that look like black dots. Cockroaches also smell unpleasant and annoy people. The most serious problem with cockroaches is that they cause or trigger asthma. Asthma is a very serious breathing disease. Many people with asthma are very sensitive to cockroaches (dead bodies, old skins, and droppings).

Where it Lives

They like warm, tropical, wet weather. Inside houses they often find these conditions in kitchens, bathrooms and basements. Favorite spots include: under refrigerators, under sinks, near leaky plumbing, near the appliances like stoves, dishwashers, and washing machines, and inside walls. German cockroaches like the dark and spend at least 85% of their time in the dark. They also like pressure on at least two sides of their bodies. If you see a lot of German cockroaches in light, open areas (like countertops), it usually means that the walls are too crowded! You will never see most of the cockroaches.

What it Eats

The German cockroach will eat almost anything. They are scavengers. They will eat any food that people eat or throw away. Leftovers, crumbs, dirty dishes and garbage provide a feast for cockroaches. They also love pet food. They even eat things we don't think are edible like hair, leather, wallpaper, wallpaper paste, soap, and soap scum in bathrooms!

Other Facts

Like all insects, cockroaches have skeletons on the outside of their bodies. This is called an **exoskeleton**. When they grow bigger they need to shed that skin. A new one will harden underneath. When a cockroach goes from one nymphal stage to the next and sheds a skin, we call it **molt**ing. Each German cockroach can molt as many as 7 times. This means for every adult cockroach, there are 7 old skins lying around. If you have 100,000 cockroaches, that is a lot of skins. German cockroaches can also multiply very quickly. Starting with one female, you can have 100,000 by the end of the year including her babies and their babies and their babies.

All About the House Mouse



What It Looks Like

The house mouse is a rodent with brownish-gray fur. It can be six inches long including the tail. The tail is the same size or longer than the body. The nose is pointy, and the ears are large. The ears are big enough to cover the eyes if someone pulled the ears down (although nobody would!) Like all rodents, mice have whiskers and four legs. Mice do NOT turn into rats!

Why it's a Pest

Mice are linked with many diseases. The common diseases that they spread are often called “food poisoning.” One common disease spread by mice is *Salmonella*. Mice leave droppings and urine everywhere that they travel, eat or sleep. When they leave droppings and urine on dishes or in food, they also leave disease-causing germs. When we put our food on that plate or eat that food, we can get sick. Mice also chew wires which can lead to electrical fires. Many fires with “unknown” or “electrical” causes, are caused by the chewing of mice or other rodents.

Where it Lives

House mice like to live near people and often make their nests inside where it is warm and close to food. They shred paper, furniture stuffing, fabrics, and other soft materials to make nests. They rarely travel more than 30 feet from their nest. When food is nearby, they may travel only a few feet.

What it Eats

Cheese is NOT the favorite food of mice. They will eat it, but there are many other foods that mice like better. Mice prefer cereal, grains (oatmeal, wheat, rice, flour), nuts, bird seed, dog food and other related foods. Peanut butter is great to put on traps because the mice like it and have trouble stealing it. They also will eat most types of edible food including crumbs and food left on dirty dishes. Mice nibble, or eat tiny amounts constantly. Mice get most of the water they need from the food they eat, but they will drink if water is around.

Other Facts

Mice can fit through holes the size of a dime. They are very curious and nibble constantly. Mice have poor eyesight and use their whiskers to help them travel around in the dark. In addition to a good sense of touch, mice have excellent senses of smell and hearing. They are most active at night. Animals that are active at night are nocturnal.

Mice travel the same path over and over. Since they leave droppings everywhere, we can find the path and put snap traps along it. Because mice are very curious, they can usually be caught easily. Besides droppings, we can tell mice have been around by nibbling marks, holes in bags and boxes, nests, tracks and noise in the walls.

All About the Norway Rat



What It Looks Like

The Norway rat is the most common rat pest in the United States. It is a rodent with brown to black fur. It can be sixteen inches long including the tail. The tail is shorter than the body. The nose is blunt or rounded, and the ears are small. Rats have very large feet compared to mice. Like all rodents, Norway rats have whiskers and four legs. Rat and mice are different animals. Mice do NOT turn into rats!

Why it's a Pest

Rats can cause many diseases including *Salmonella*, plague and rat bite fever. Some diseases that they spread are often called “food poisoning.” Rats leave droppings and urine everywhere that they travel, eat or sleep. When they leave droppings and urine on dishes or in food, they also leave disease-causing germs. When we put our food on that plate or eat that food, we can get sick. Rats bites can also cause people to become sick.

Rats chew wires which can lead to electrical fires. Many fires with “unknown” or “electrical” causes, are caused by the chewing of rats or other rodents. Their constant chewing can damage a lot of property including walls, pipes, and furniture.

Where it Lives

Rats often live in nests made in burrows in the ground. You may see holes to the burrows near concrete, garbage storage areas, in plantings, yards or gardens, or near brush piles. They can also make nests in walls, cluttered areas or storage rooms, or in sewers and storm drains. Rats often travel 100 to 150 feet from their nests in search of food. This means they can have a nest in someone's yard and travel over 100 feet to a different house or dumpster for food. For this reason, everyone in a community needs to be involved in controlling rats. Trying to control them in one house doesn't usually work.

What it Eats

Rats like to eat food high in protein including meat, fish, insects, pet food, nuts and grain. They will eat garbage or most edible food. Peanut butter is a good food to put on traps. Rats hoard or store food in hidden places. They are very cautious about new things. Trapping is often not as successful as with mice, because the rats will be cautious of a new trap. They may also already have food stored away, so they don't need new food. Rats need water every day and prefer nests where water is nearby.

Other Facts

Norway rats can fit through holes the size of a quarter. They are excellent swimmers and can tread water for three days! Their teeth are extremely sharp and can chew through almost anything. They can even chew through metal pipes. Rats are active at night. Animals active at night are nocturnal. Rats have poor vision, but have excellent senses of touch, smell, and hearing. In addition to droppings, you can tell there are rats around by noticing burrows (holes in ground), tracks, gnawing damage, or noises.

All About Ants



What They Look Like

This is a picture of a black carpenter ant queen. All ants are social insects, which means that they live in colonies. There are usually three types of ants in each colony: workers, queens, and males. All ants go through complete metamorphosis. This means they go through four life stages: egg, larva, pupa and adult. There are many different kinds of ants. They are different sizes, colors and eat different things. Like all insects, all ants have three body parts, two antennae, and six legs. All ants have a “thin waist” between the thorax and the abdomen. Termites, which are sometimes confused with ants, have “thick waists.” Since there are so many types of ants, the best way to know what type you have is to take it to a University for identification.

Why They are Pests

There are more ants than any other type of social insect (insects that live in colonies). Entomologists, people who study insects, believe there are over 1,000,000,000,000,000, or 1 quadrillion, ants on earth at any time. Most of these are not pests. Black carpenter ants, big black ants, chisel out nests in wood with their jaws. If they are nesting in a house, the chiseling may weaken the house. Another type of ant, the pavement ant, leaves mounds of sand, dead ants, and debris on sidewalks and sometimes in basements or locker rooms. In the South, fire ants sting people. Even if the ants do not sting or cause damage, people do not usually like seeing a lot of them inside!

Where They Live

Black carpenter ants nest outside in hollow trees and stumps or inside in wood or spaces in walls. Inside, they prefer very humid or moist conditions around windows, doors, showers, bathtubs, dishwashers, leaky pipes and drains, and under leaky roof shingles. Even if they nest outside, they may come into houses in the spring or summer looking for food. Pavement ants often nest outside under rocks, at the edges of sidewalks or pavements, door stoops and patios. Inside they are often found in basements or locker rooms, or near cracks in the foundation.

What They Eat

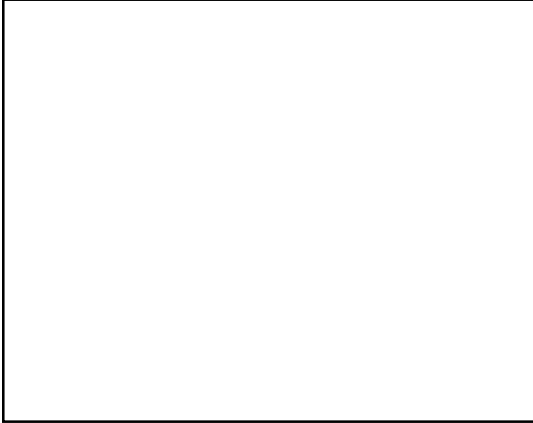
Different types of ants like different foods. Black carpenter ants like to eat fruit juices, sweets, meats, and moist kitchen garbage. They do not eat wood; they just nest in it.

Other Facts

Both black carpenter ants and pavement ants are very tidy. Workers clean out their nests all at once. This results in piles, mounds or dump sites. For black carpenter ants, these piles will contain sawdust, wood pieces, dead ants, and ant parts. The mounds for pavement ants usually contain sand, dead ants, and ant parts. In the Midwest, these are the ants that commonly cause mounds in the cracks in the sidewalk.

IPM TEAM'S MOST WANTED

Pest: _____



Identifying Characteristics:

Wanted for:

Likes to live:

Likes to eat:

Look/Listen for:

Special skills:

IPM TEAM'S MOST WANTED

Pest: House Mouse



Identifying Characteristics:

brown and furry

tail as long as body

5-7 inches long (with tail)

makes squeaky noises

whiskers

mammal-4 legs

Wanted for:

spreading germs and making people sick

causing fires by nibbling wires, damaging property

Likes to live:

inside or outside near buildings

in dark, warm places that are close to food

Likes to eat:

peanut butter

cereal

rice, oatmeal and flour

bird seed, dog food

Look/Listen for:

droppings

tracks

nibbling marks and holes

noise in the walls

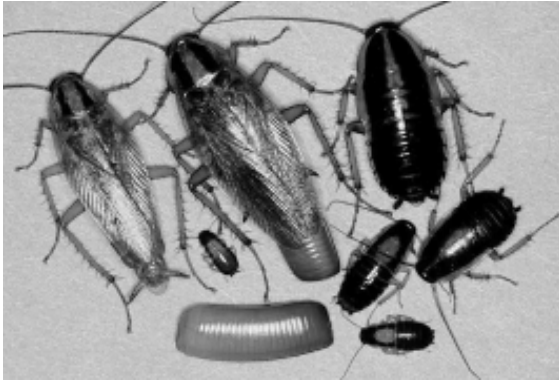
Special skills:

House mice can fit through holes the size of a dime.

They travel the same path over and over. They are very curious and nibble most of the time.

IPM TEAM'S MOST WANTED

Pest: German Cockroach



Identifying Characteristics:

6 legs, 2 long antennae
brown with two black stripes
on their back above the wings
adults are 5/8 inch long
fast runners
females carry egg cases

Wanted for:

being the #1 pest causing asthma, making asthma and
allergies worse, spreading germs

Likes to live:

in dark, wet places like under sinks and refrigerators,
warm areas close to food

Likes to eat:

almost anything

wallpaper glue

crumbs and leftovers

soap

Look/Listen for:

live or dead roaches

egg cases

old skins or legs

droppings-black dots

Special skills:

Starting with one female you can have 100,000 by the
end of the year(including her babies and their babies
and their babies!)

IPM TEAM'S MOST WANTED

Pest: Norway Rat



Identifying Characteristics:

brown to black hair

tail shorter than body

16 inches long (with tail)

rounded nose, large feet

whiskers

mammal-4 legs

Wanted for:

spreading germs and making people sick

causing fires by nibbling wires, damaging property

Likes to live:

outside: in sewers, storm drains, and tunnels in ground

inside: cluttered areas, storage rooms, in walls

Likes to eat:

peanut butter

cereal, flour, grain

fish, meat, garbage

pet food

Look/Listen for:

droppings

tracks

gnawing marks

burrows in ground

Special skills:

Norway rats can fit through holes the size of a
quarter. They are excellent swimmers and climbers.

They can gnaw through almost anything.



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