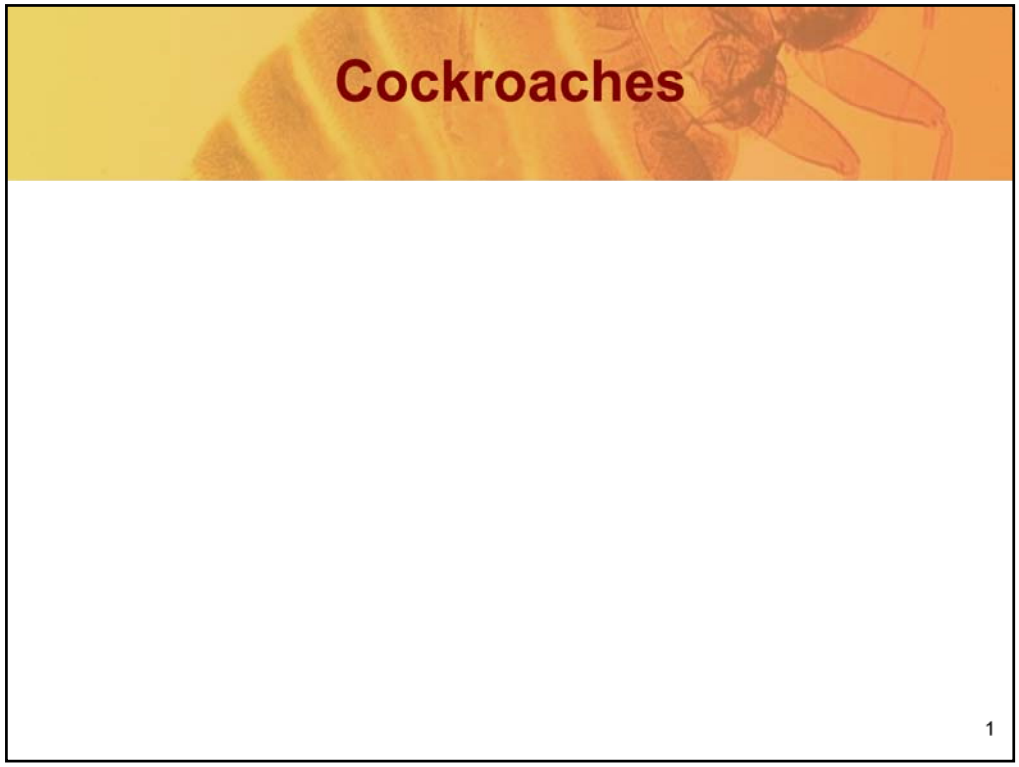
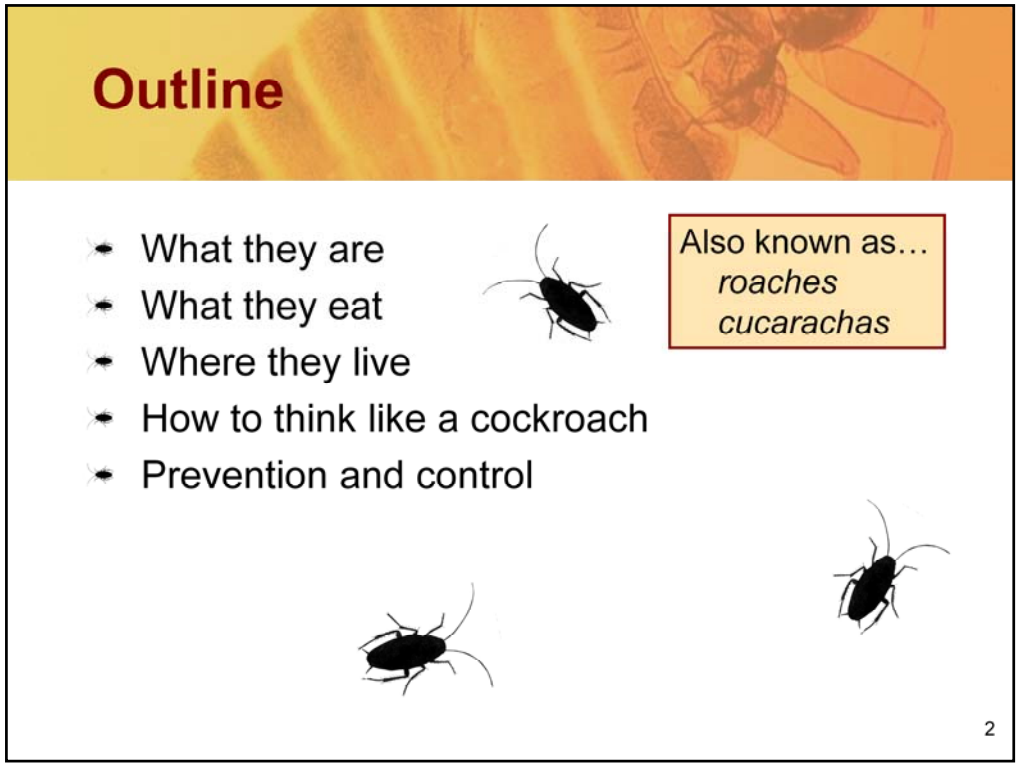
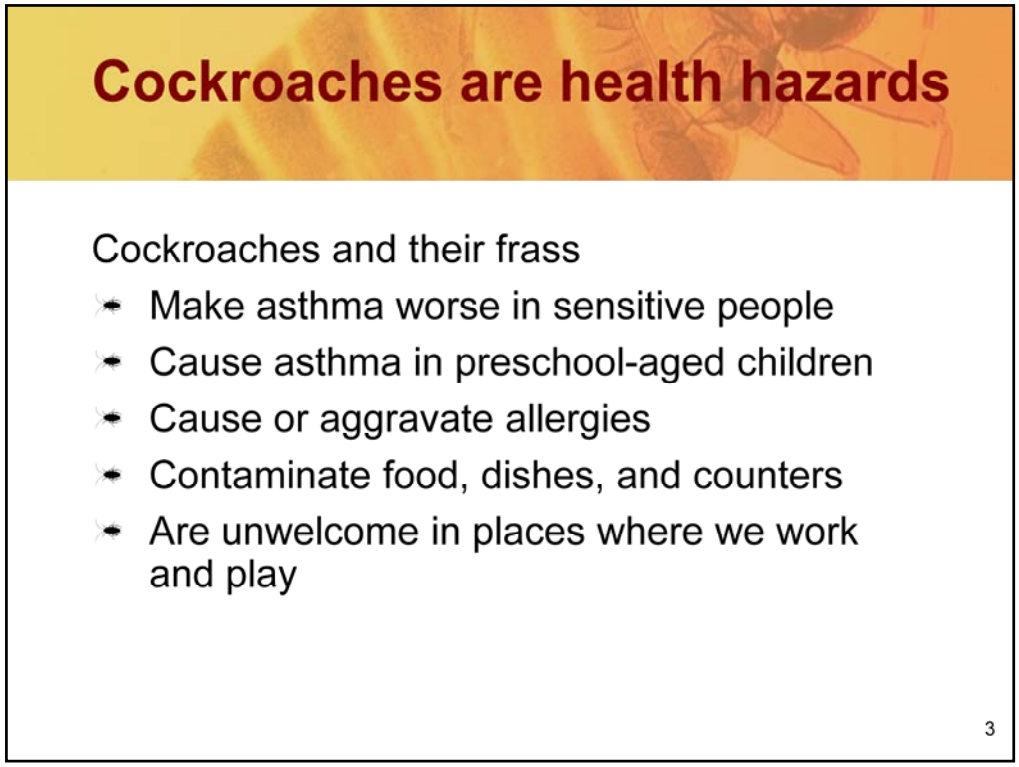


This presentation deals with controlling cockroaches.



Here is an outline of this presentation.



The research on the asthma connections are based on the German cockroaches.

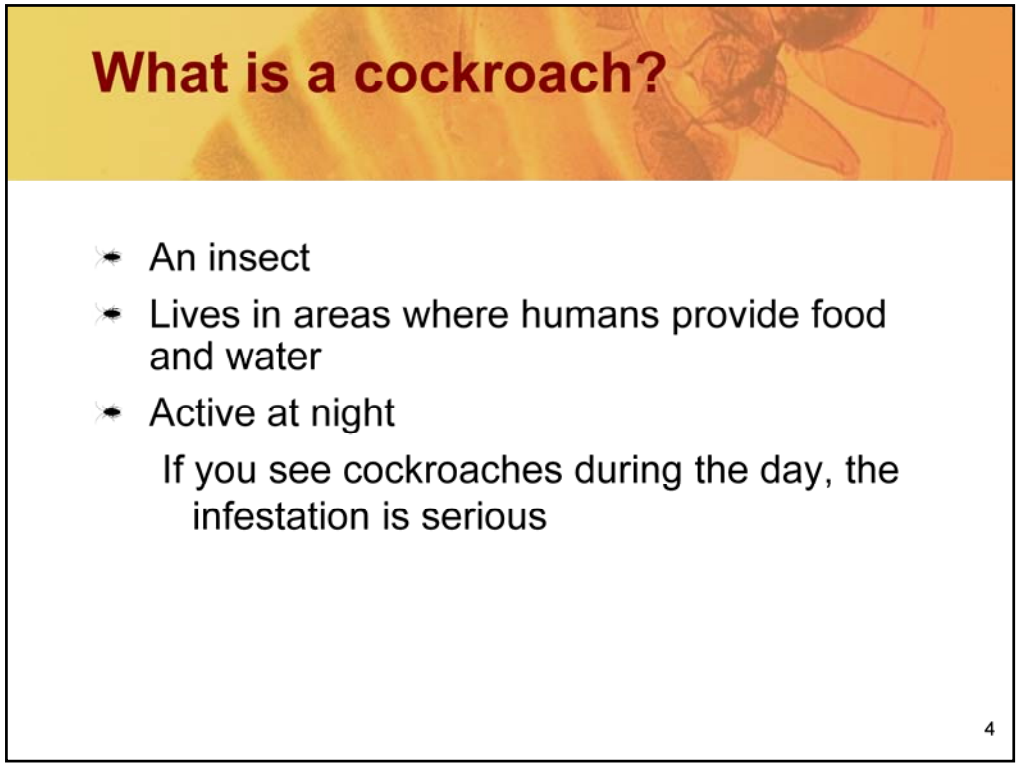
Introduce the word "frass," which is the poop produced by insects. Cockroaches communicate by smelling and tasting frass.

For sensitive people with asthma, eight units of cockroach allergen per gram of dust can trigger a reaction. ONE female cockroach will produce 1500 units per day! One cockroach and its frass can be an asthma trigger. An IPM program should work to eliminate the cockroaches and clean up the frass. The repairs and measures taken to control one cockroach will benefit the building in more ways than just pest control.

Help the trainees understand that the asthma connection comes from frass and body parts that the cockroaches leave behind. Getting rid of the infestation helps, but does not remove the remains. Cleaning using simple soap (not smelly cleaning agents) will remove the allergens, remove the cockroaches' mode of communication, and allow residents and staff to see when new evidence shows up.

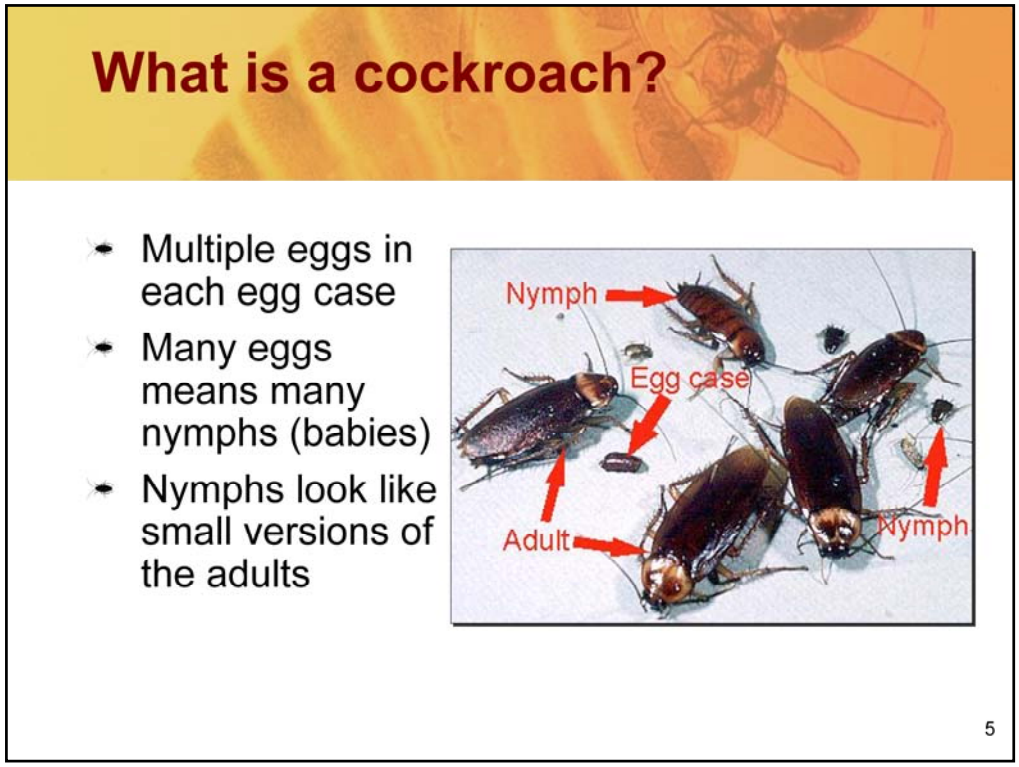
Have the trainees think about all the areas where cockroach infestations could be health hazards: childcare facilities, recreation rooms, workplaces…

Reference: National Academies Press, 2000. Clearing the Air: Asthma and Indoor Air Exposures. Executive Summary Institute of Medicine. ISBN 0-309-06496-1. See www.nap.edu/books/0309064961/html/.



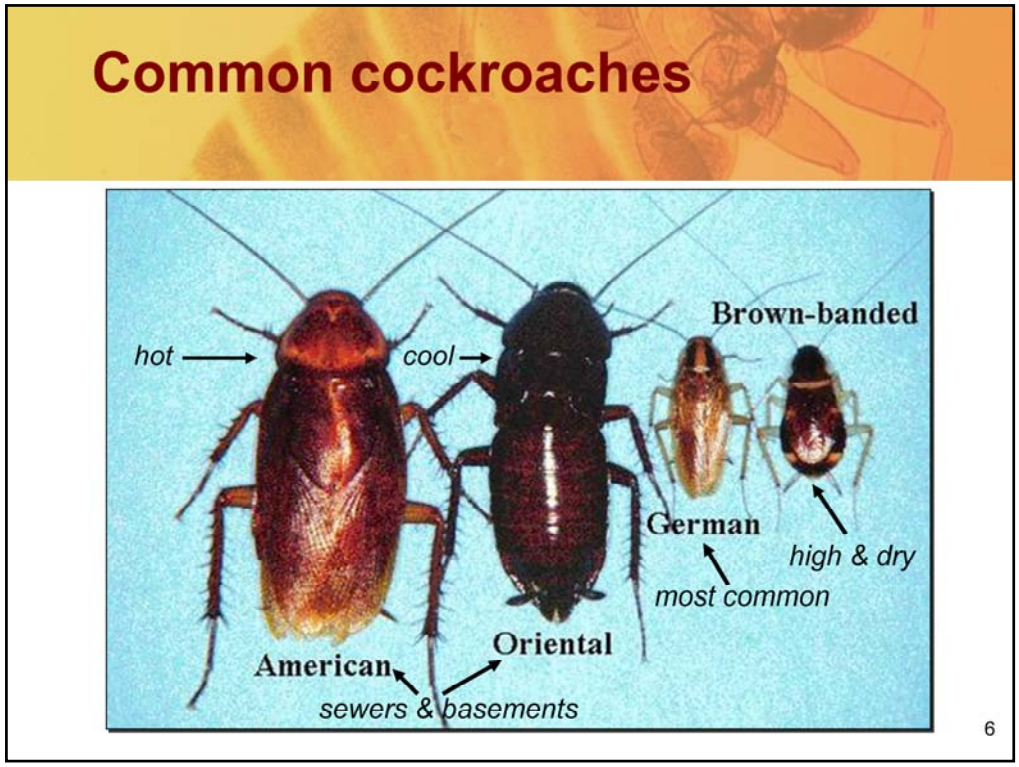
Cockroaches are a good indicator of the need for improved sanitation in an area.

Clear up confusion by stating that a “roach” and a “cockroach” refer to the same thing; they are not two different insects.



Trainees don't need to be experts on all pests, but they need to know the basic biology and behavior of pests in their buildings.

Suggestion: avoid using the term "instars." Nymph is the term used throughout the training. There is no need to explain complete versus incomplete metamorphosis.



Four types of cockroaches found in public housing are of concern. German Cockroaches have the highest priority. Other kinds of cockroaches exist, but are not covered here because they are not found in large numbers in buildings. These non-pest kinds usually are carried into buildings by accident.

Different kinds of cockroaches have different preferences for food and shelter. American cockroaches like hot environments; Oriental cockroaches like cool environments. Brown Banded cockroaches like to be “high and dry.”

American and Oriental cockroaches are invaders. They typically enter the home seeking food or water but do not remain in large numbers.

German (especially) and Brown Banded cockroaches are infesters. They take up residence in the home when adequate food, water, and harborage are found and their populations may grow exponentially.

Trainees should be able to identify American, Oriental, German, and Brown Banded cockroaches.

There is a connection between German cockroach and asthma.

German cockroaches live in the areas we live in. They like to be in our homes. They like warmth.

They are more effective reproducers than the other cockroaches in a variety of ways. They are quicker to reproduce, the egg cases hold more cockroaches, and the eggs are more likely to survive because they are held inside the mother until one day before they hatch. If she dies, they will still hatch, so it is important to clean up dead cockroaches.

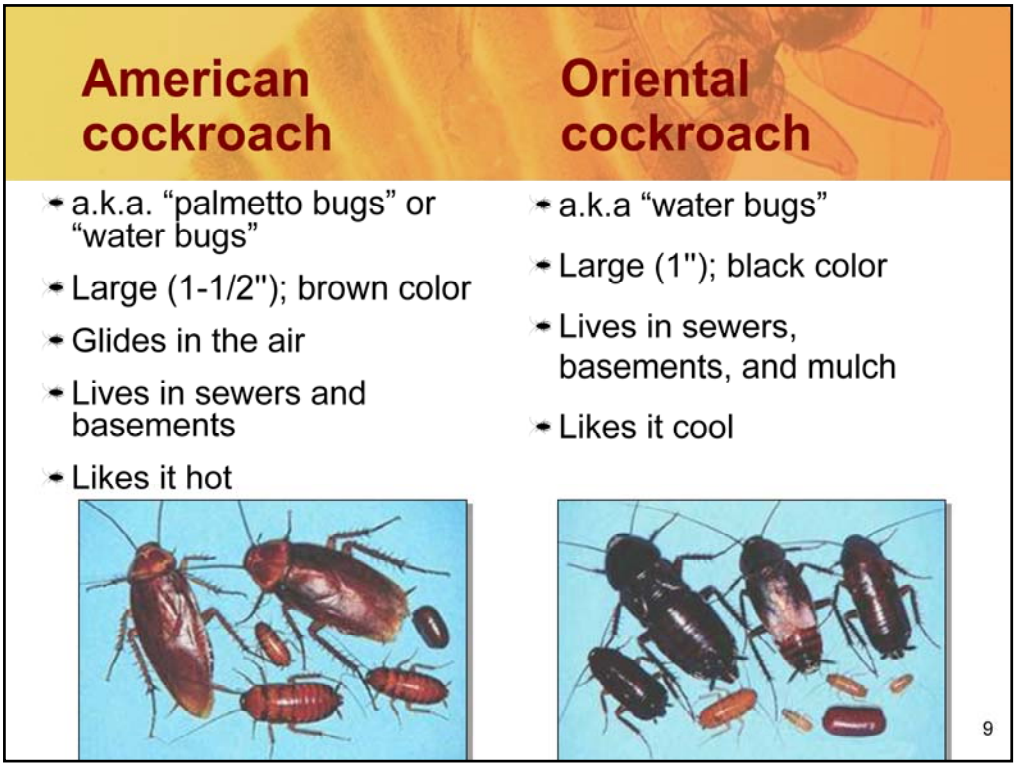
Brown banded cockroach

- Small size (1/2") with side-to-side stripes
- Found in warm and dry spots, often up high
- Lives in scattered locations, often behind pictures and appliances

8

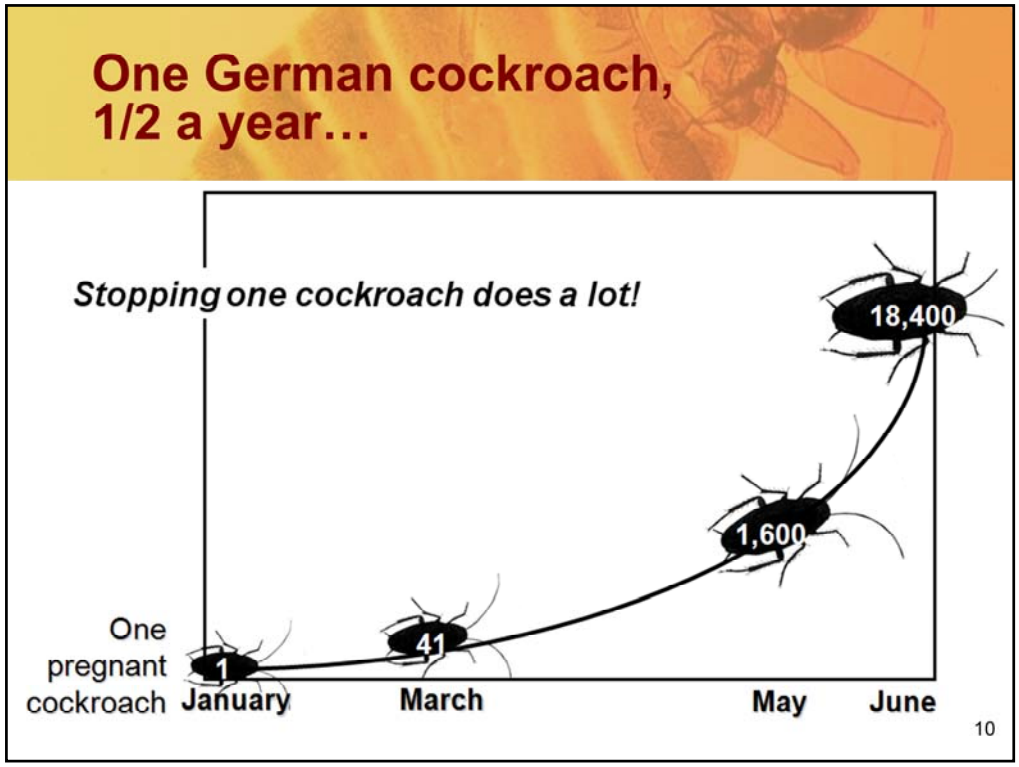
Emphasize “high and dry.”

Note that destroying one egg case prevents 40 cockroaches from hatching and infesting.



American: Warm and wet. In a damp basement behind a water heater would be an ideal place to look for them. They are not as big a challenge as German cockroaches because their populations don’t grow as fast. Unlike German cockroaches, they will stick their eggs to objects near where the living conditions (for a cockroach) are good. Placing the egg case outside makes the eggs susceptible to environmental conditions that could kill them before they hatch.

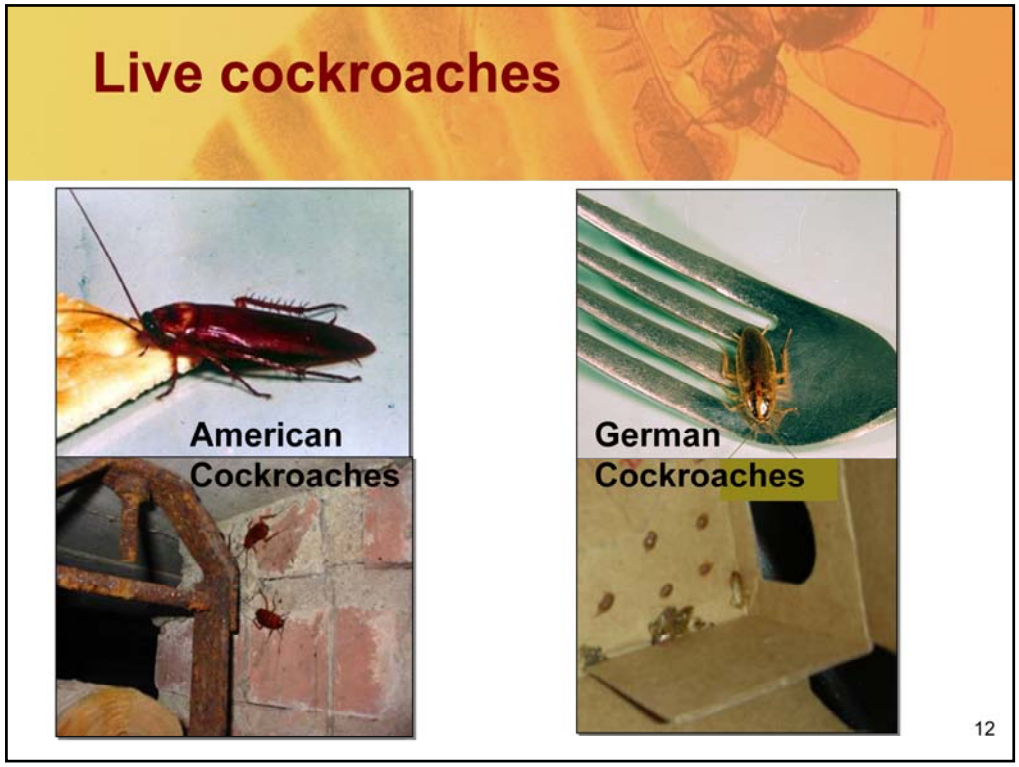
Oriental: These pests are less of a problem than German or American. They are large, flightless, and like it cooler. They tend to come inside when outside areas get dry and they need water.



This growth curve is for a German cockroach. A population can get out of hand very quickly. Calculations are based on 40 eggs per case (20 male, 20 female), one month for eggs to develop, one month after hatching they can reproduce. Females develop one egg case a month. The graph assumes no death due to environmental factors and a 1:1 male to female ratio which are unrealistic, but the potential for population growth is a fact, with or without environmental influences.

Use this graph and the asthma connection to make the argument that no number of cockroaches should be tolerated. One can become a lot very quickly.

IPM doesn't only deal with the adults that are seen moving around. Cockroaches spend most of their time hiding. To know about cockroaches, trainees need to know all the evidence of their presence. They may only smell them or see frass. If a live cockroach is seen, it usually means that the nest was disturbed or that the infestation is severe.

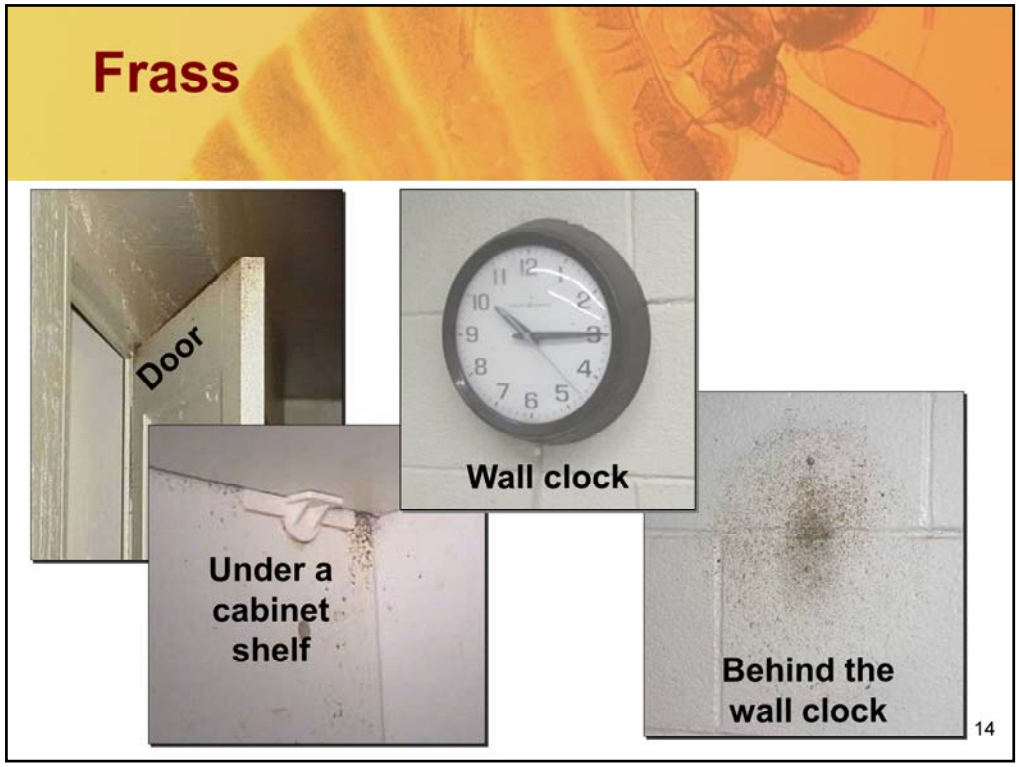


Left: American cockroaches.

Right: German cockroaches (note the presence in a cardboard box). *Note that cardboard and paper bags should be recycled or thrown away immediately after being emptied because they may have cockroach eggs from a distribution facility, they offer great hiding spots, and the glue can feed the cockroaches.*

Left: Sticky trap with German cockroach adults and nymphs *(mention that the sticky trap is a tool you will show them*). *The presence of so many nymphs on the trap indicates it may have been placed near a nest. It is important to note where traps are placed so that patterns like this can be seen and area can be treated accordingly.*

Right: Brown banded cockroaches that have been squished when the door closed.



Frass along the top of a door, under a shelf, and on a wall where a clock was hung (*note that when the clock was there the place looked clean…trainees have to know where to look to find signs*).

Suggestion: use the clock as a review of the kinds of cockroaches. The kind that infested behind the clock were Brown Banded (high and dry).

Trainees have to know where to look for cockroaches because they are most active at night and most will be hiding at any time. Cockroaches love appliances that have water associated with them.

Suggestion: Have trainees reason that the kitchen is the most likely place (food and warmth from the stove, refrigerator, and under the sink); the bathroom is second because of water. Cockroaches can be found in other rooms as well. Inspection should be done in all rooms (even bedrooms, living rooms), especially when the infestation is bad. If cockroach signs are found in the unit, bait should be placed in all rooms. Take this opportunity to get the trainees to think like a pest and decide where they would want to live.

What cockroaches eat

- Crumbs
- Grease
- Trash
- Cardboard glue
- Just about anything

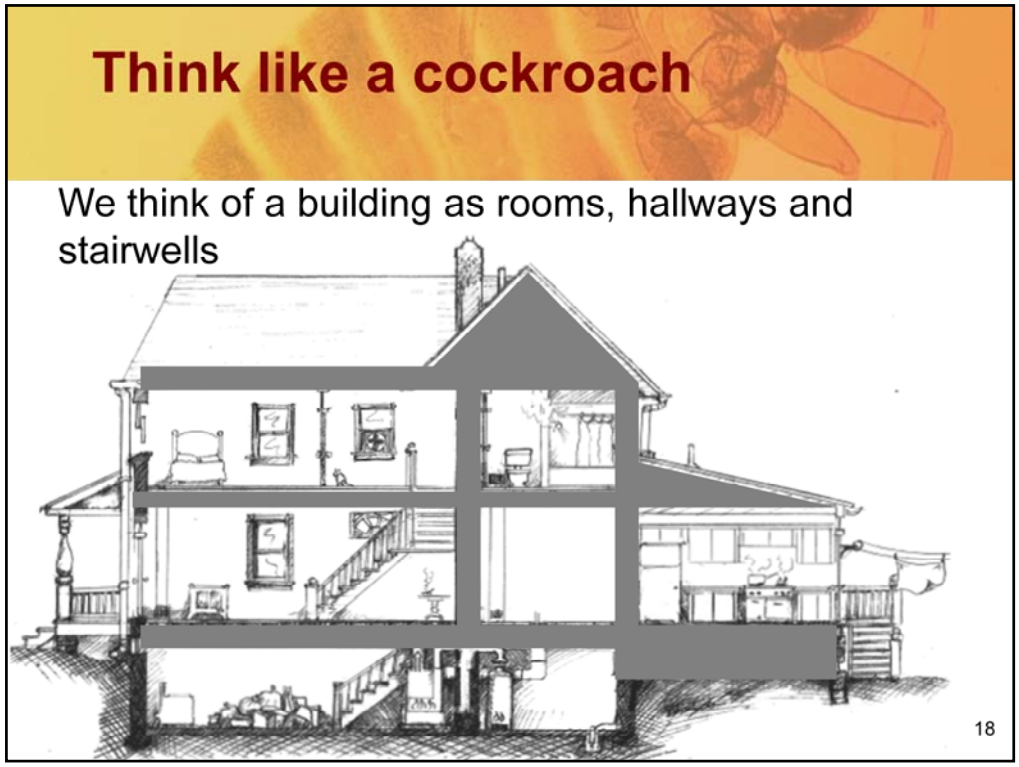
Under the bag in a trash can

16

Cockroaches will survive on most anything.

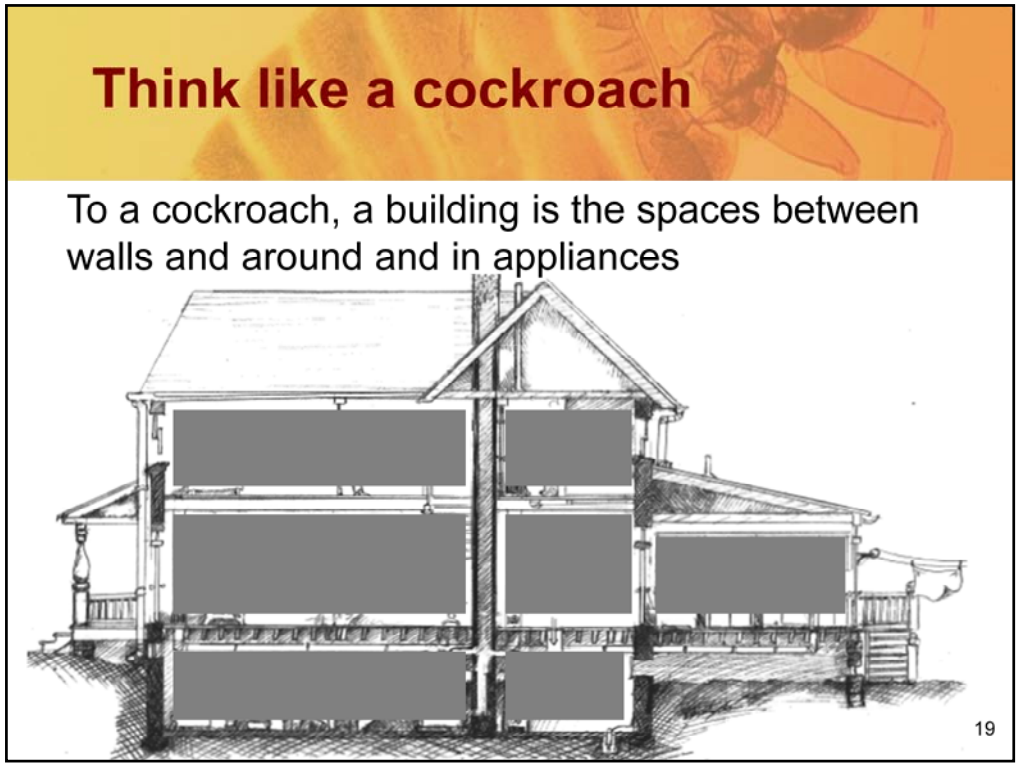
One drop of grease will feed 20 cockroaches for a day…cleaning is important in cockroach control!

Cockroaches can live a month without food, but survive only a week without water…removing water sources is important!



Trainees should go about looking for cockroach signs by thinking like a cockroach.

Most people think of a building in terms of its rooms. Often, the areas of the building that are blocked off here are ignored.



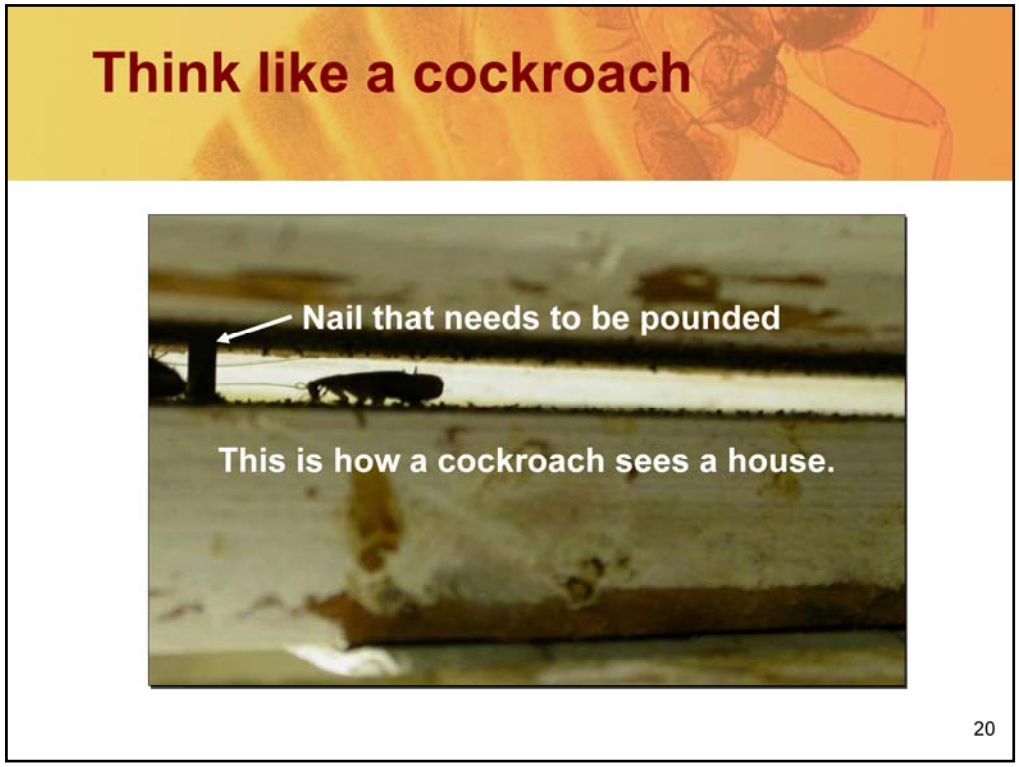
Food and water have been discussed, this slide gets trainees thinking about where cockroaches hide. To know where to look for cockroach hiding spots, trainees must think like a cockroach.

Use the training space as an example. Is there a drop ceiling? This is like a pest superhighway. What's behind the electrical outlet?

Suggestion: Have trainees brainstorm areas where cockroaches might hide.

Macro-thinking: Kitchen, bathroom, boiler room, trash chute, dumpster

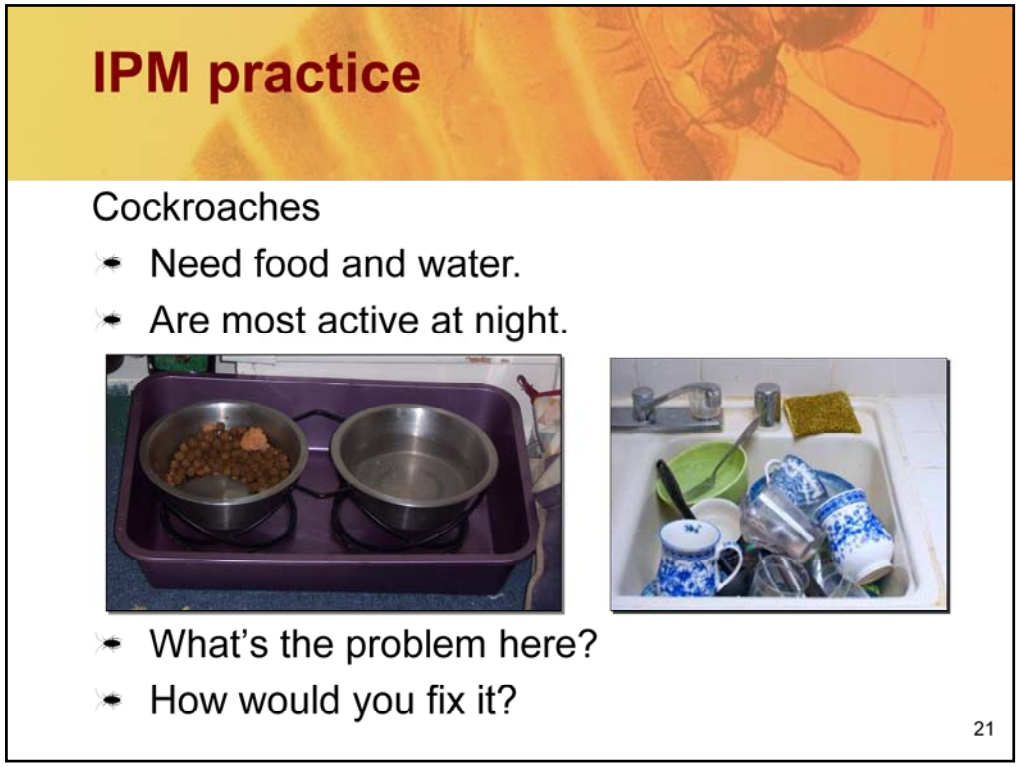
Micro-thinking: Toaster, oven, behind/under the refrigerator, under the trash can



Cockroaches live in the building, but they don't see the building the same way we do. To them, any crack or hole is a door and in-between walls and floors is the safest place to travel and hide: a cockroach freeway. This photo shows two boards that are loosely held together by a nail, creating a perfect place for this cockroach to hide. This is actually the door hinge that was shown previously (it is rotated 90 degrees counterclockwise).

Maintenance repairs will disrupt cockroach travel and hiding, making them easy to find and kill. The repairs also benefit the building.

In addition to making repairs that prevent future cockroaches, trainees should be taught to clean up after the ones that were present by vacuuming using a HEPA vacuum and scrubbing the frass with soap and water.



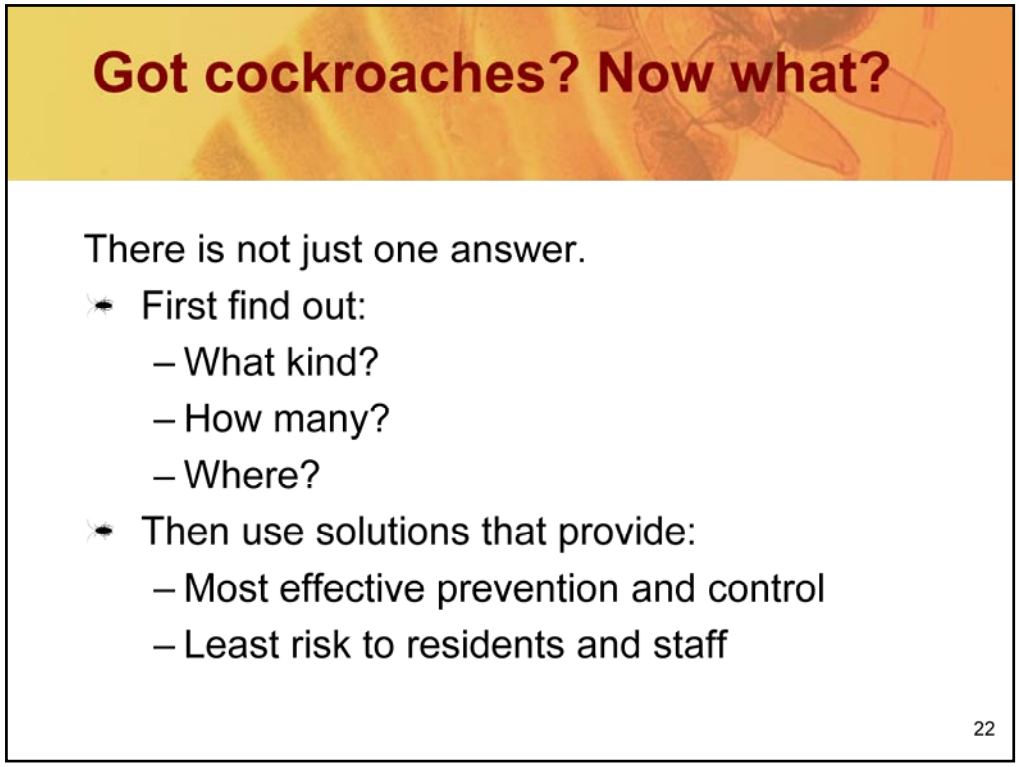
Observations: Dog food and water left out. Dirty dishes are left in the sink to soak overnight.

Trainees should now apply what they've learned.

Trainees should suggest that cleaning and drying dishes nightly and picking up pet food at night will go a long way to control the pest at no cost to the PHA.

This example shows how knowledge of the pest along with awareness of the environment and a simple change in practices can result in pest management.

Suggestion: Discuss the use of the pan under the food and water dishes. This makes it easier to pick up spills from a sloppy eater and may restrict some pests from feeding.



IPM is tailored to each situation. Practitioners use specific information to make the best decisions about control.

What kind of cockroach? It is useful to know which of the cockroach species is present, because the plan for control should match their life cycles and habits.

How many? Is this just a beginning infestation, with only a few cockroaches, or a full blown, long-term infestation? The former situation can most likely be handled relatively easily, with fewest interventions. The latter will require everyone's cooperation to the fullest. Investing time to inspect early will help put together an effective and efficient action plan.

Where? Cockroach "hot spots" can be given most attention and may be the source of the whole population. *Reference the macro-thinking brainstorm (boiler rooms, trash chutes, or a particularly infested unit). If the most infested units are identified and focused on, the building's cockroach problem should be controlled. Identifying focus units through inspection should be one of the first steps in an IPM program.*

It is also important to record vulnerable or sensitive populations and situations: Small children, people with physical, cognitive, and/or environmental disabilities, elderly, pregnant women. Inhabited units will each require a specific plan. Vacant apartments allow more in-depth control to take place, but attempts should still be made to minimize the pesticide residues that might be left behind.

To inspect effectively, trainees must know to look in areas where cockroaches are living. They should look where cockroaches might hide for the previously discussed signs of cockroaches*. A reporting system is crucial so the PMP will know where to apply pesticides (and where NOT to apply), the staff will be aware of units having sanitation issues, and all will know if any units are occupied by vulnerable or sensitive populations.* If cockroaches are being reported in clean units, trainees should know to check the adjacent units because they may be generating a cockroach population.

Children are often the best inspectors. If there are kids in an area, they should be asked if they have seen the target pest. They may know the source.

_____

Reference: How to Control Pests Safely, pp. 2-3

Cockroaches are active at night when people aren't looking and they hide where people don't usually look. Monitors help find cockroaches when and where people can't.

Show a sticky trap.

A common way to monitor for cockroaches is to use sticky traps. Sticky mineral-based glue is put on paper. There is no pesticide.

The paper is folded to keep out other pests out (and the curious cat). In this type, the paper is folded into a triangle. It has glue in small places on the outside to keep it in place. *The key is to properly place the trap in a corner or near a water source.*

A few things to note about the pictures:

1. The traps with cockroaches were in the kitchen and bathroom. The kitchen was worse. The other traps were in the bedroom.
2. The small cockroaches (nymphs) in the lower left photo indicate that the trap was close to the nest. Cockroaches travel only 5 to 10 feet from the nest. Small ones travel less distance.
3. The tongs in the background allow one to avoid touching the cockroaches on the traps.
4. The cockroaches can survive for several weeks on the glue trap.

Sticky traps are information-gathering tools. They alert to a growing infestation in common areas, such as trash chutes and trash storage areas. To see changes that indicate a growing population, the sticky traps must be checked and changed periodically. Suggest writing a date and specific location (e.g. Unit 315 Bathroom) on them when placing so that patterns and the time it took to catch the number of cockroaches will be known. The concept of an IPM log will be introduced in the IPM and Pesticide Use section, but take this opportunity to demonstrate how keeping records of trap counts could tell a lot about the problem.

Traps that are covered, like the three on the left, above, should be put in a re-sealable bag and brought to the property manager or designated person who will assess the information.

Hand out sticky traps and have trainees put them together. Ask trainees to brainstorm areas where sticky traps should be placed. Note that this will be practiced later.

Prevention and control: Sanitation

- Good sanitation makes pest control work.
- Eliminate hiding spots, food, and water available at night by
  - cleaning the kitchen;
  - reducing clutter;
  - throwing away dead cockroaches;
  - cleaning frass and areas where there were cockroaches with simple soap and water.

25

By “simple soap” we mean non-smelly cleaning products. It doesn’t take much to break the molecules that trigger asthma, but water alone won’t be effective. Strong chemicals will contaminate nearby baits (discussed later). It’s important to remove the frass, since that is the asthma trigger, but not reduce the efficacy of other control tools.

Reference: www.epa.gov/epp/pubs/products/cleaning.htm for more information on appropriate cleaning products.

The left picture shows a wallpapered wall in a bathroom that needs repair work. It's harboring cockroaches. Making these types of repairs is good for the building and good for pest control. The photo on the right is a crack in the plaster that could be hiding cockroaches. *Show and tell the exclusion tools listed, then encourage a discussion about caulk.* Although most expensive, silicone caulk will provide the longest lasting control since it adheres to surfaces and holds through the inevitable slight shifting of buildings.

Weatherstripping is not pest-proofing. Door sweeps are essential on doors leading to the outside.

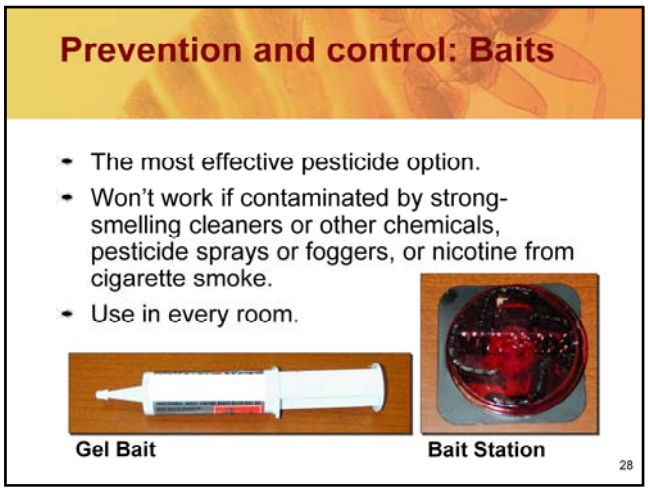
Young cockroaches want a crevice as thin as a dime. Adult males want a space the thickness of a quarter. Pregnant females want the most space of all to hide: two stacked nickels. All like to be squeezed.

Reference: How to Control Pests Safely pp. 6-7

Reference: Bobby Corrigan's Sealant vs. Caulk Comparison

After this slide will be three pesticide options for cockroaches that can be used to complement other IPM practices.

Pesticides may not be an option if an individual has multiple chemical sensitivities; in that case sanitation, sticky traps, and exclusion will need to be the IPM plan.



Baits are the most common and effective pesticide for cockroaches nationwide.

Baits and gels rely on roaches wanting to eat them. If baits are contaminated with chemicals that the cockroaches recognize as poison, cockroaches will avoid them. This is often why residents say that baits "don't work." They won't if the resident is also applying aerosol cockroach killers in the same room. Strong-smelling cleaners can have the same effect. Nicotine from smoking will also contaminate the bait. This is one reason why gloves should be worn when placing bait. When cleaning out cabinets before putting in bait stations, strong-smelling cleaners should not be used. Regular soap and water is effective and won't ruin the bait's effectiveness.

The photos above are of two common methods of delivering baits. The photo on the right shows a bait station. The photo on the left shows the same pesticide in gel form. Small dots (about the size of a pea) of this gel are put into cracks, crevices, and corners where there is frass. It works the same as the bait station but more care must be used to keep it away from curious children. It should be used only in cracks and crevices to keep children from getting at it. When re-applying, old bait should be removed*. It lasts about three months—less time than bait stations since it is more exposed* to the air. When it dries out, the cockroaches will not be attracted to it.

Note that bait storage is also a concern. If baits are stored with herbicides or cleaning products, they may become contaminated and ineffective. This holds true for rodent baits (which will be discussed later).

Suggestion: Pass out bait station.

Reference: See www.epa.gov/epp/pubs/products/cleaning.htm for more information on appropriate cleaning products.