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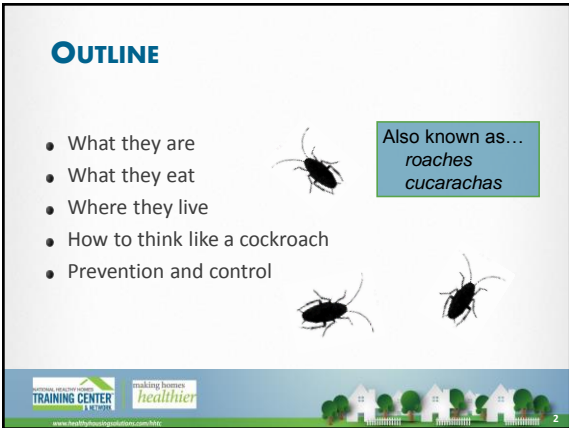
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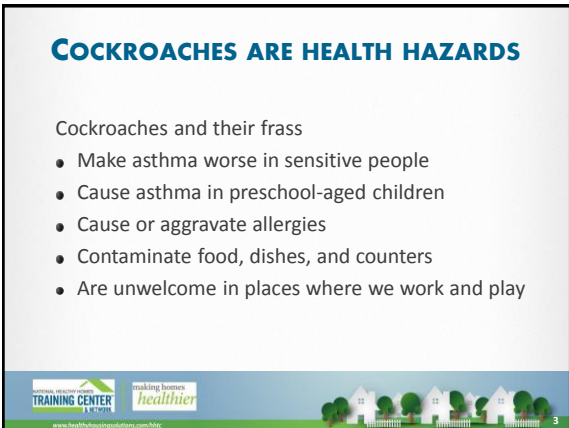
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### WHAT IS A COCKROACH?

- An insect
  - Lives in areas where humans provide food and water
  - Active at night
- If you see cockroaches during the day, the infestation is serious



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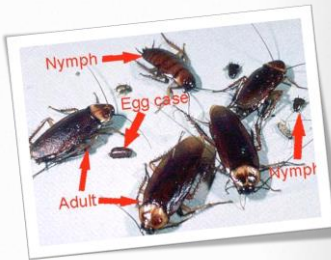
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### WHAT IS A COCKROACH?

- Multiple eggs in each egg case
- Many eggs means many nymphs (babies)
- Nymphs look like small versions of the adults



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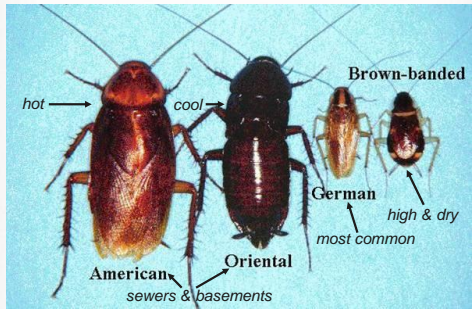
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### COMMON COCKROACHES



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### GERMAN COCKROACH

- Medium size (3/4"), bronze, with "racing stripes" behind the head
- Found everywhere, but likes warmth, moisture, and darkness
- Reproduces quickly
- Mother carries eggs to term even if she is dead
- Eats almost anything



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### American cockroach

- a.k.a. "palmetto bugs" or "water bugs"
- Large (1-1/2"); brown color
- Glides in the air
- Lives in sewers and basements
- Likes it hot



### ORIENTAL COCKROACH

- a.k.a. "water bugs"
- Large (1"); black color
- Lives in sewers, basements, and mulch
- Likes it cool



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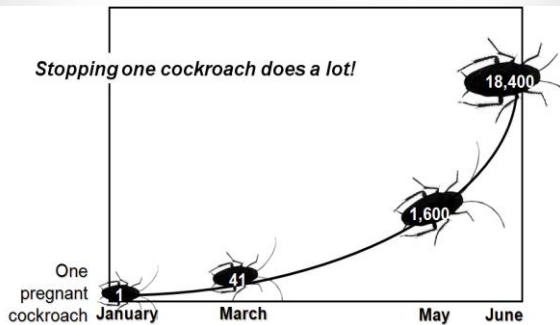
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### One German cockroach, 1/2 a year...

Stopping one cockroach does a lot!




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### SIGNS OF COCKROACHES

Live cockroaches

Dead cockroaches and the parts

Frass

Egg cases



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### LIVE COCKROACHES



American Cockroaches



German Cockroaches



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11

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### DEAD COCKROACHES



German cockroaches on a sticky trap



Brown banded cockroaches by a door hinge



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12

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### FRASS

Door

Under a cabinet shelf

Wall clock

Behind the wall clock

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### WHERE COCKROACHES LIVE

- Anywhere in a building
- Prefer spots near water but also need food and warmth
- In cracks and crevices where their bodies touch surfaces above and below

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### WHAT COCKROACHES EAT

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

Under the bag in a trash can

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### WHERE COCKROACHES DRINK

- ✦ Sinks
- ✦ Counters
- ✦ Floors
- ✦ Pet bowls
- ✦ Shower stalls
- ✦ Sweaty pipes
- ✦ Refrigerator drip pans and gaskets
- ✦ AC units



Sources of water in a kitchen



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### THINK LIKE A COCKROACH

We think of a building as rooms, hallways and stairwells



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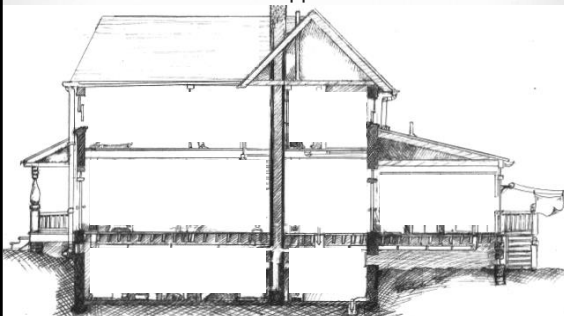
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### THINK LIKE A COCKROACH

To a cockroach, a building is the spaces between walls and around and in appliances



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### IPM PRACTICE

- What's the problem here?
- How would you fix it?



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### COCKROACH COMMON AREAS: REFRIGERATORS AND STOVES

- Daily: wipe grease and crumbs from the stove top
- Weekly: Detailed cleaning of stove top— remove burners and wash drip pans
- Quarterly:
  - pull appliances away from the wall and clean the floor underneath,
  - clean under the stove top,
  - clean or replace the stove vent filter, and
  - wipe down refrigerator gaskets

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### DISASSEMBLED STOVE

Take a stove apart for cleaning



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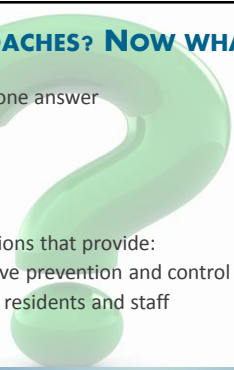
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## GOT COCKROACHES? NOW WHAT?

There is not just one answer

- First find out:
  - ◆ What kind?
  - ◆ How many?
  - ◆ Where?
- Then use solutions that provide:
  - ◆ Most effective prevention and control
  - ◆ Least risk to residents and staff



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## INSPECT

- Using a flashlight, look for evidence where cockroaches would find food, water, or a hiding spot: up, down, behind, and under
- Think like a cockroach – look in hidden areas



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## INSPECT

**Monitor** by placing sticky traps near areas where cockroaches might travel—at corners and near warmth, food, and water



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### PREVENTION AND CONTROL: SANITATION

- Good, detailed 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



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### PREVENTION AND CONTROL: EXCLUSION

Seal or fix cracks, peeled wallpaper and shelf liners, or holes that cockroaches could get through Use

- silicone caulk
- copper mesh
- screens
- door sweeps— always on boiler rooms and exterior doors



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### PREVENTION AND CONTROL: TARGETED CHEMICAL USE

- Sanitation first!
- Maintenance staff and residents should not spray. Spraying should be a last resort and done only by a PMP
- Read the ENTIRE pesticide label before buying, using, storing, or disposing of a product
- The label is the law!
- Follow the label directions closely

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### PREVENTION AND CONTROL: BAITS

- The most effective pesticide option
- Won't work if contaminated by strong- smelling cleaners or other chemicals, pesticide sprays or foggers, or nicotine from cigarette smoke
- Use in every room where inspection finds evidence



Gel Bait



Bait Station





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### PREVENTION AND CONTROL: BAITS

- The bait needs to be the only food in the area— sanitation first!
- Slow to kill: Cockroaches feed on the bait and take it back to their hiding spots where other cockroaches live

**PMP's gel bait applied under a drawer**







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### PREVENTION AND CONTROL: INSECTICIDAL DUSTS

- Least toxic active ingredients you may know:
  - boric acid
  - diatomaceous earth
- How they kill cockroaches:
  - A stomach poison
  - Dry them out
  - Contact kill
- Long-lasting if dry





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### INCORRECT USE OF INSECTICIDAL DUST



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### PREVENTION AND CONTROL: INSECT GROWTH REGULATORS (IGRs)

- Interfere with cockroach growth and egg hatching
- In sprays, aerosols, and impregnated discs
- Take a month to work
- Stay effective for a long time
- Compatible with other IPM methods; may enhance baits



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### A REVIEW OF IPM TOOLS

- Sanitation
- Exclusion
- Pesticides:
  - Baits
  - Insecticidal dusts
  - IGRs



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### DON'T USE OVER-THE-COUNTER SPRAYS AND FOGGERS

- Over-the-counter sprays and foggers are not part of IPM in multifamily housing
- They are not compatible with baits
- Cockroaches develop resistance



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### QUESTIONS?



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