

Steps to Healthier Homes

# KEEP IT PEST-FREE



Start with People



House as a System



Keep It:



1. DRY



2. CLEAN



3. PEST-FREE



4. VENTILATED



5. SAFE



6. CONTAMINANT-FREE



7. MAINTAINED



Making it Work

# LEARNING OBJECTIVES

Name three illnesses or injuries associated with pest infestation.

Identify three clues of pest infestation.

Identify the three strategies associated with an IPM approach.

Name two illegal pesticides that may be used in the home.



# HEALTH EFFECTS OF PESTS

- Asthma
- Infectious diseases
- Health effects greater on children



# HEALTH EFFECTS OF PESTS

- Exposure to Pest Allergens

Pest	Pathway	Allergen
Dust Mite	Feces	Der p 1
Cockroaches	Feces	Bla g 1 & 2
Mice	Urine	MUP



# HEALTH EFFECTS OF PESTS

- Bites
- Common Culprits
- Rabies



*Mosquito bites*





# HEALTH EFFECTS OF PESTS

- Rat Bites



Rat bites/multiple





# Allergens in cockroach feces

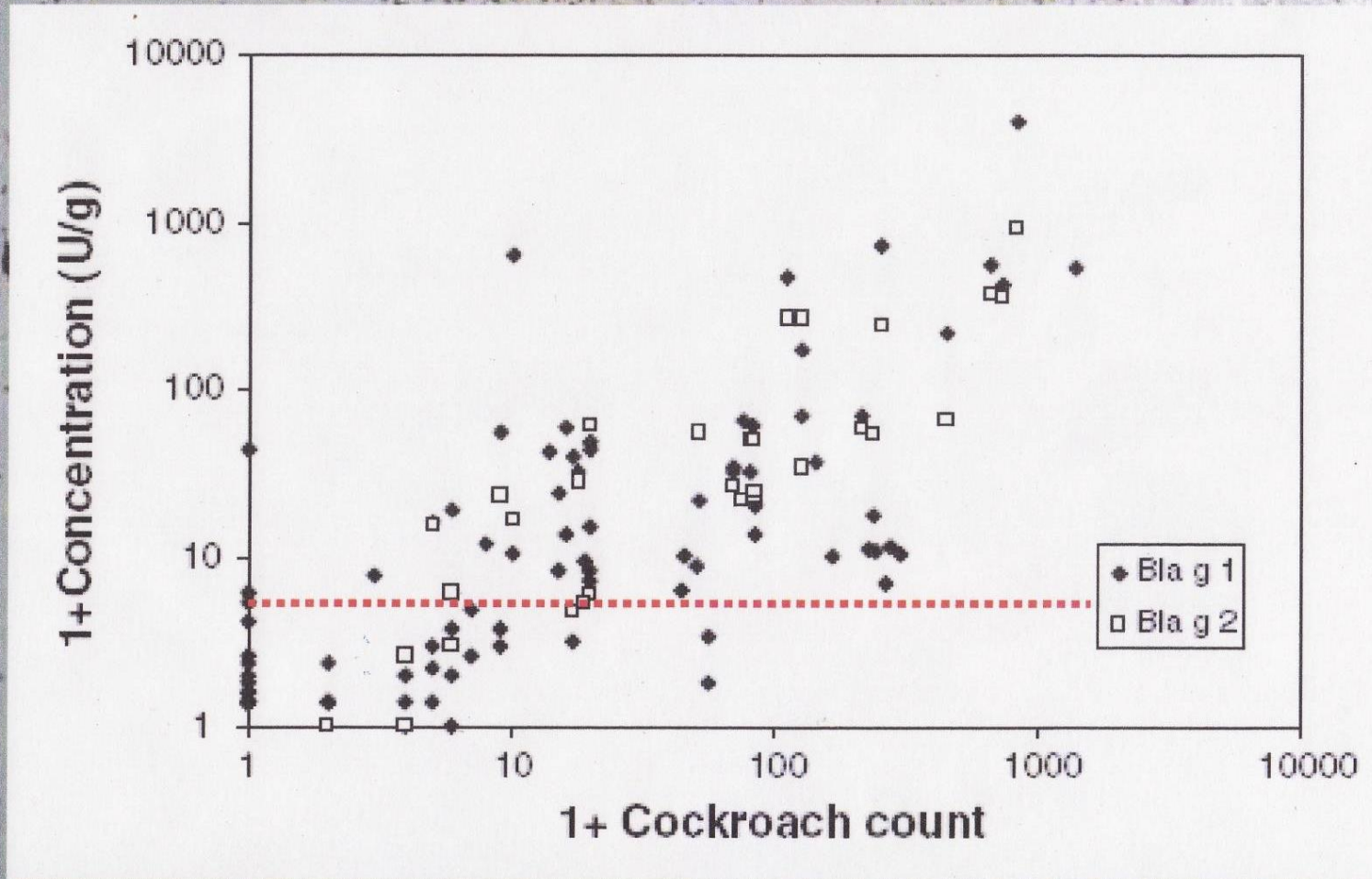
## Poop arithmetic 101

1 fecal pellet = ~1 mg  
1 mg feces = 500 Units Bla g 1  
1 female = 3 mg feces per day  
1 day = ~1500 Units Bla g 1

Human sensitization threshold	=	<u>per grm dust</u>	2 Units
Morbidity (illness) threshold	=		8 Units



# More cockroaches = More allergen





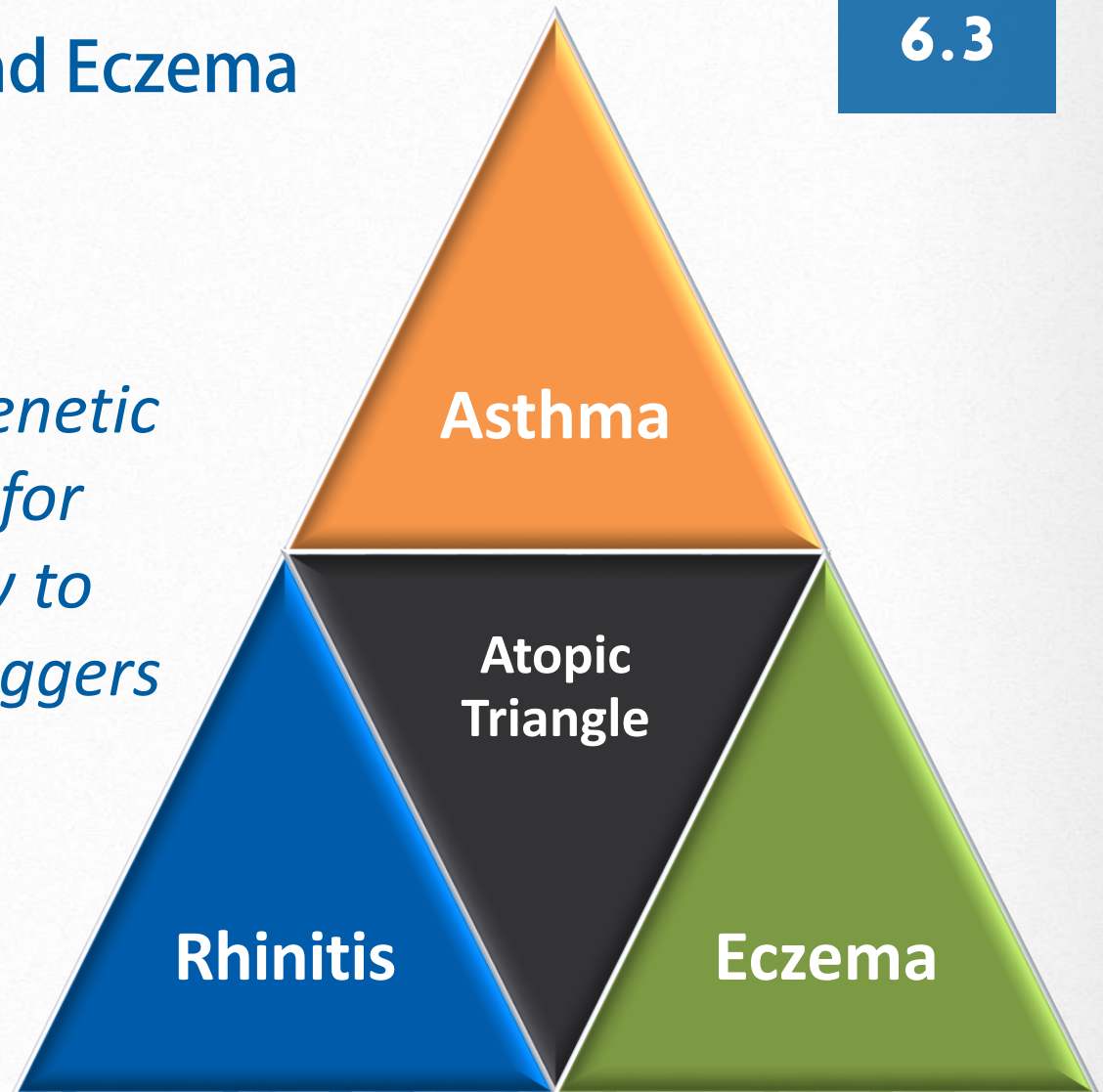
# THE ATOPIC TRIANGLE

Asthma, Allergies and Eczema

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***Atopic:***  
*pertaining to a genetic predisposition for hypersensitivity to environmental triggers*



# THE ATOPIC TRIANGLE

## Asthma, Allergies and Eczema

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Pests

Immunoglobulin E (IgE) producing conditions

Conditions interact/trigger; commonly coexist

Environmental conditions trump genetics

Hygiene hypothesis





# ANOTHER TRIANGLE...



*The Pest Triangle*



# HOW COMMON ARE PESTS?

## American Housing Survey (2011)

### All Housing

- 1.0% Rats
- 11.1% Mice
- 0.6% Rodents, unsure of type

### Below Poverty

- 1.8% Rats
- 12.5% Mice
- 1.0% Rodents, unsure of type



*Rat feces in insulation*





# How COMMON ARE PESTS?

- Philadelphia, 2007
  - ◆ 62% Cockroaches
  - ◆ 72% Mice
- National 2002-2006
  - ◆ 33% Rat allergens (inner-city)
  - ◆ 63% Mice allergens
    - (95% low-income)
  - ◆ 85% Cockroach allergens



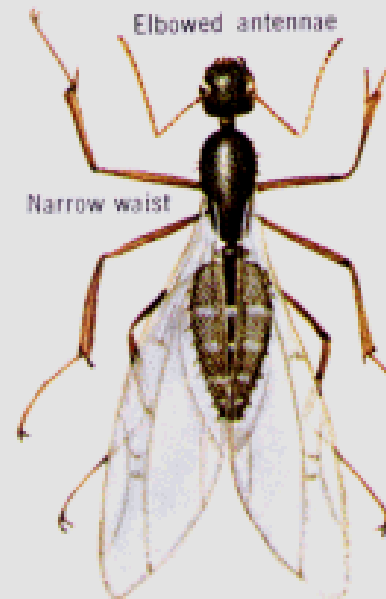
Cockroach traps under sink



# HOW DO WE CONTROL THEM?

- Prevention
- Sanitation
- Physical controls
- Ongoing monitoring

This is a winged  
**ANT**



Front wings longer  
than back wings

Actual size 1/2-inch

This is a winged  
**TERMITE**



Both pairs of wings  
same size

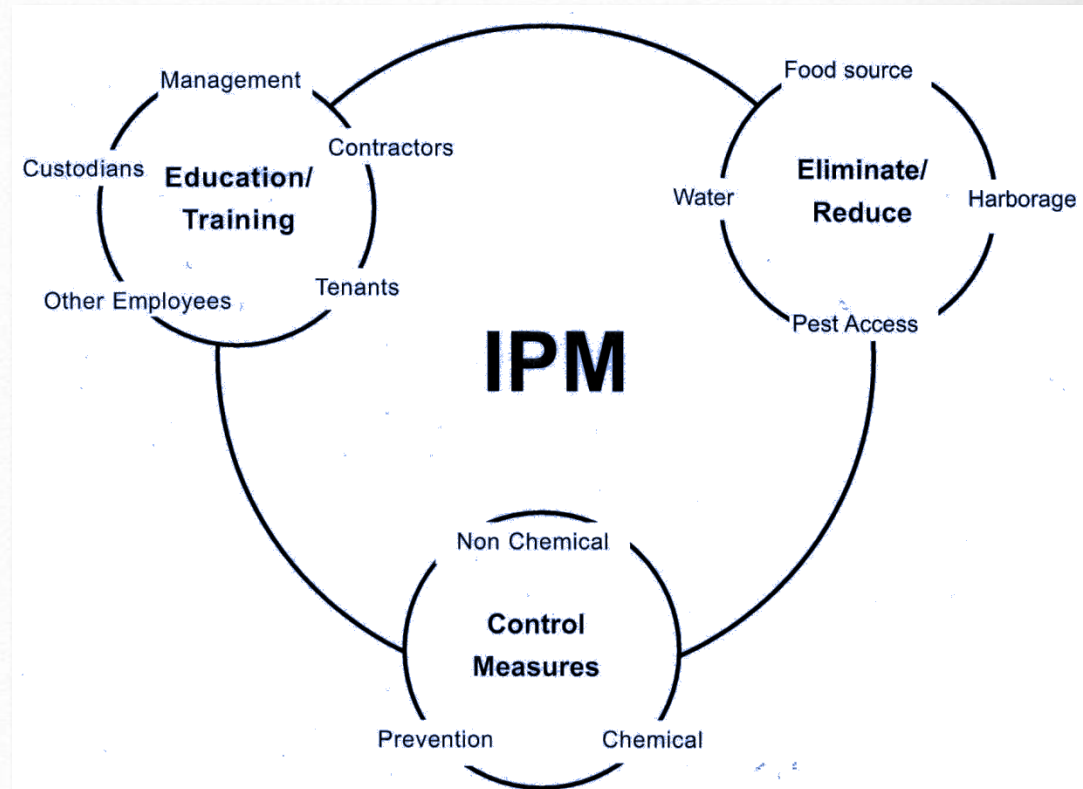
Actual size 1/2-inch





# INTEGRATED PEST MANAGEMENT

- Best practice
- Multiple tactics
- Effective control
- Least risk to the environment
- Least exposure of non-target organisms
- Economic sustainability



# REDUCE PESTICIDE USE

Pest pressure can drive people to unsafe use of pesticides.

- Too much
- Too many
- Wrong kind – unsafe & illegal





# PESTICIDES AND POISONINGS

- 16,000 pesticide exposures requiring treatment reported (2007)
- Pesticides usually stored within reach of children
- 95% of children poisoned were under age 6



# THE IPM PYRAMID



# IPM v. CONVENTIONAL PEST CONTROL

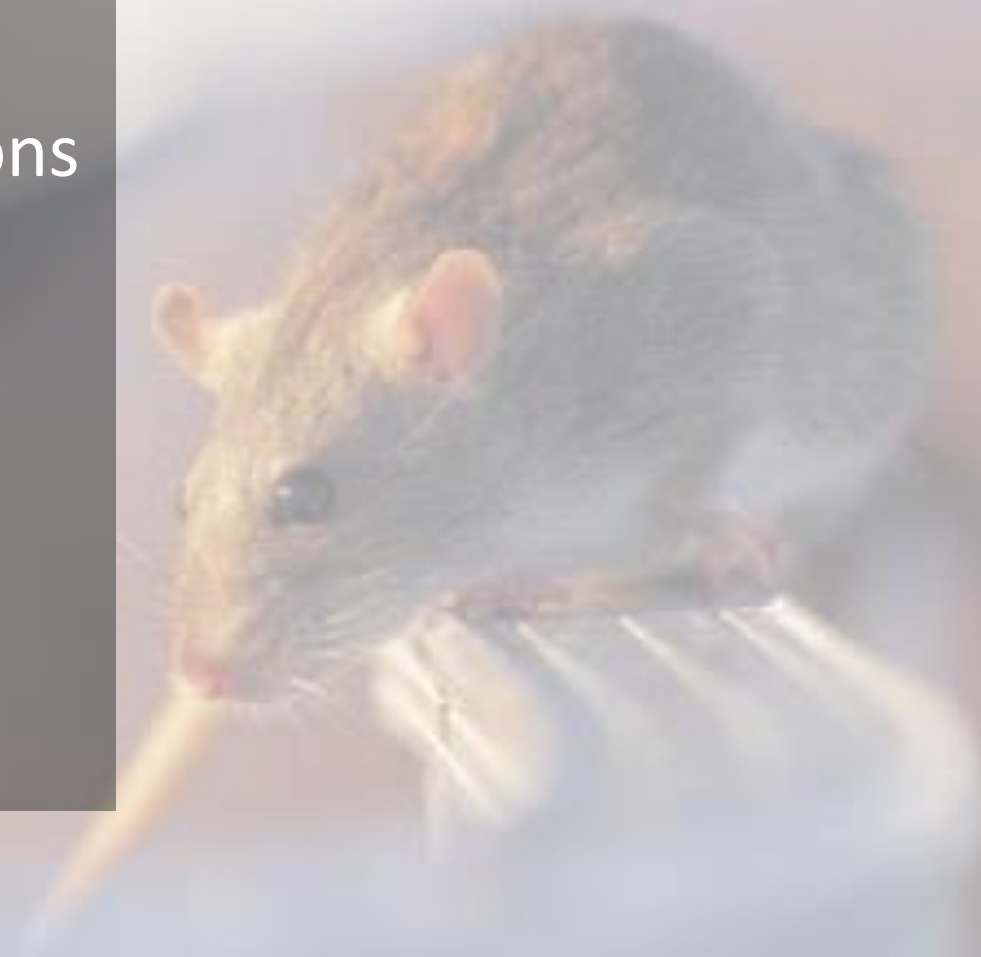
Activities	Conventional	IPM
Program Strategy	Reactive pest control	Preventive pest control
Resident Education	Minimal	Extensive
Spraying & Fogging	Extensive	Rare
Rodent/bird control	Poisons	Exclusion/ Trapping





# HUD GUIDANCE ON IPM (2011)

- Communication
- Environmental conditions
- Identification and reporting
- Ongoing monitoring, reporting and tracking
- Action levels
- Waste management

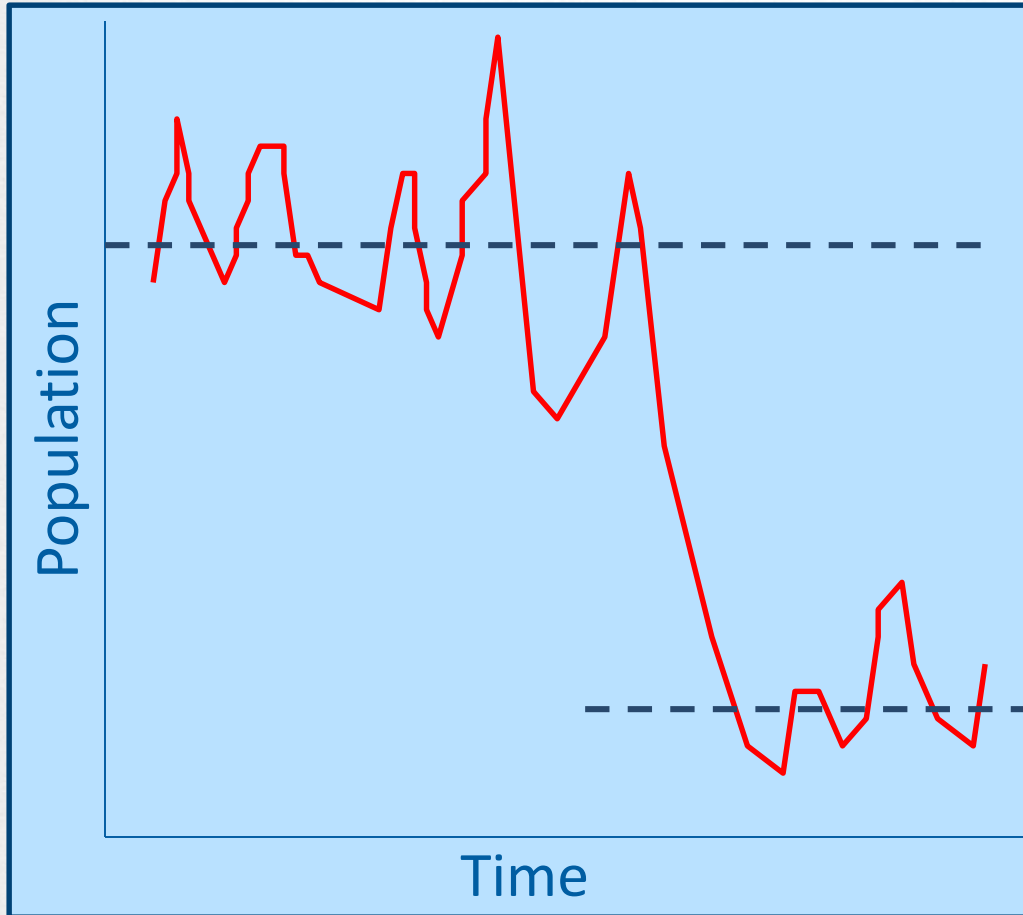


# HUD GUIDANCE ON IPM (2011)

- Appropriate pesticides
- Exclusion & denial
- Educational outreach
- State laws on used furnishings
- Use least-risk pesticides when necessary
- Pesticide-use notification signs



# CHANGE THE HABITAT



- Don't just kill, change "conditions conducive" to pests
- Reduce the carrying capacity of the environment





# IPM: STEP-BY-STEP

- Inspection & Identification
- Exclusion & Denial
- Education & Action
- Sanitation
- Physical control
- Monitoring



# 1. INSPECTION & IDENTIFICATION

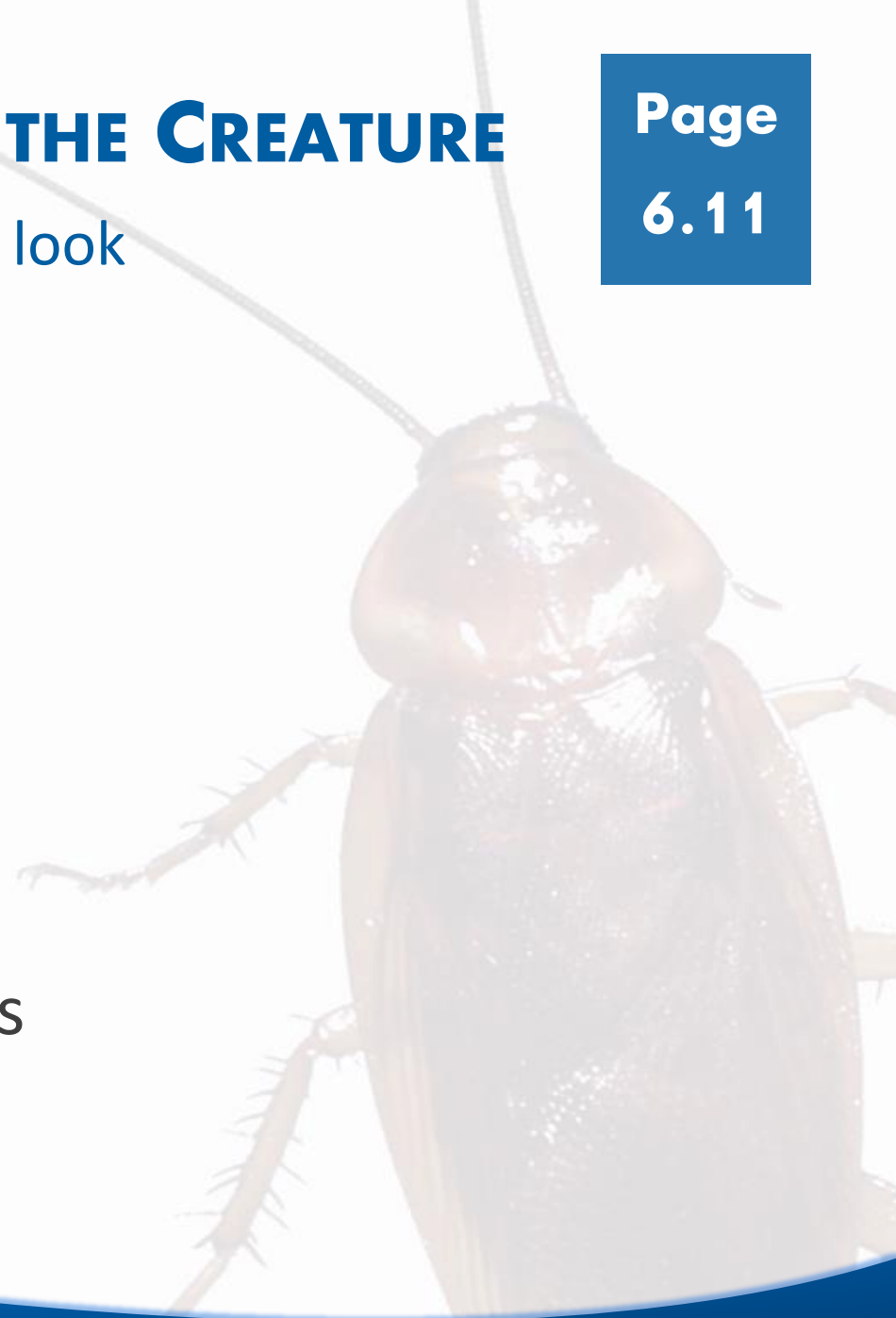
- Thorough inspection
- Identification of pests found



# SEE THE CREATURE, BE THE CREATURE

What to look for and where to look

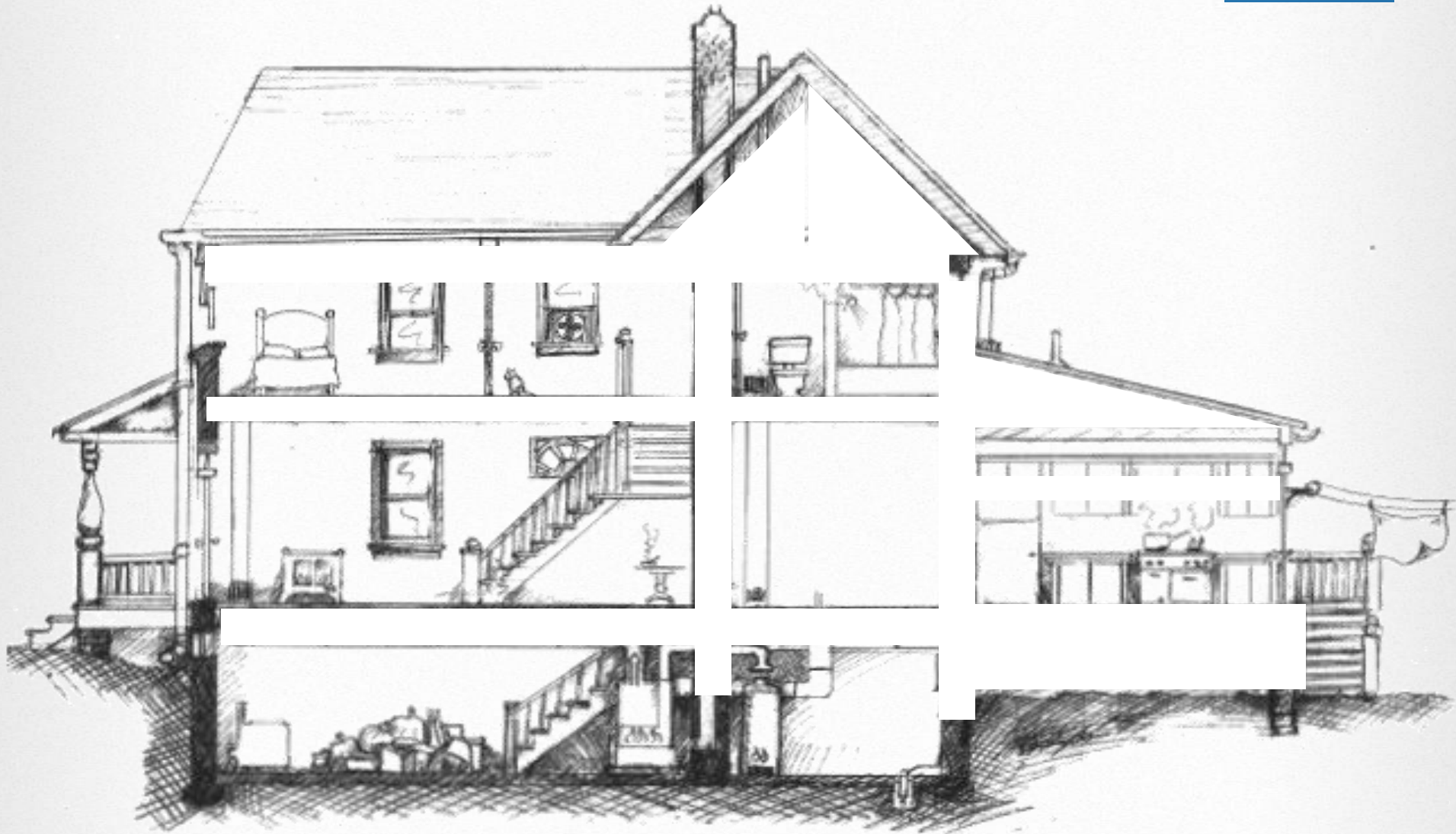
- The pest
- Droppings
- Nests and burrows
- Food and water sources
- Hidden places
- Near entry holes
- Warm cavities for insects





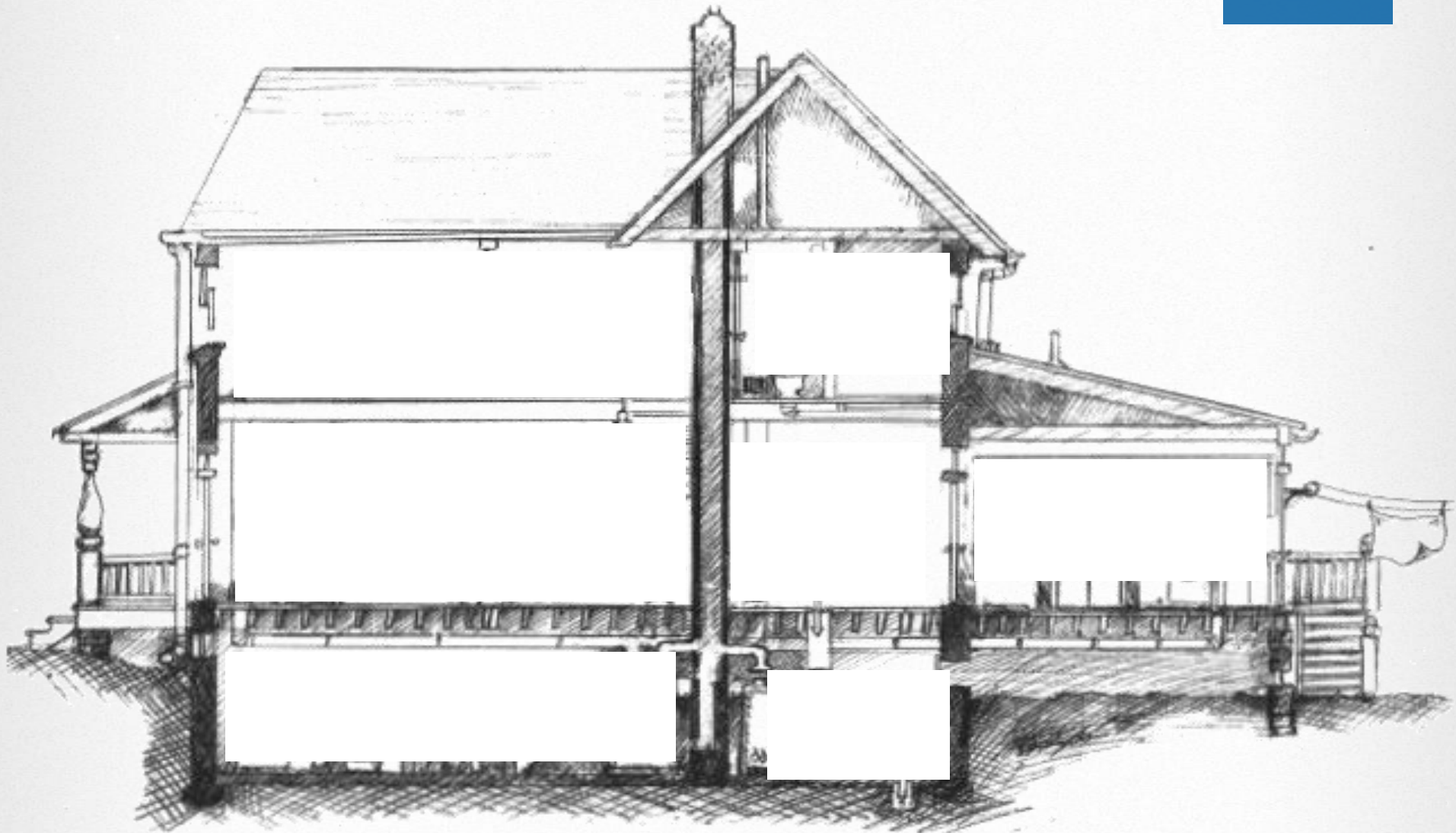
# A PERSON'S VIEW

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# A COCKROACH'S VIEW

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# A COCKROACH'S VIEW

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*Rat proofing  
did not work  
here...*

*Get down on the ground and  
look under the pipe...*



## 2. EXCLUSION AND DENIAL

- Stoppage
- Inspection
- Holes filled
- Stuff-It
- Silicone Caulk
- Spackle, etc





### 3. EDUCATION & ACTION

- Understand pests
- Control – what, how, and when
- Safe vs. unsafe practices
- Educating residents
- Choosing PCO's
- Training PCO's





## 4. SANITATION

- Food
- Water
- Harborage



03/18/2008

Photo: City of Houston, Bureau of Children's  
and Environmental Health



# WATER

- Essential for insects & rats, but not for mice or bedbugs
- Mosquitoes
- Structural damage



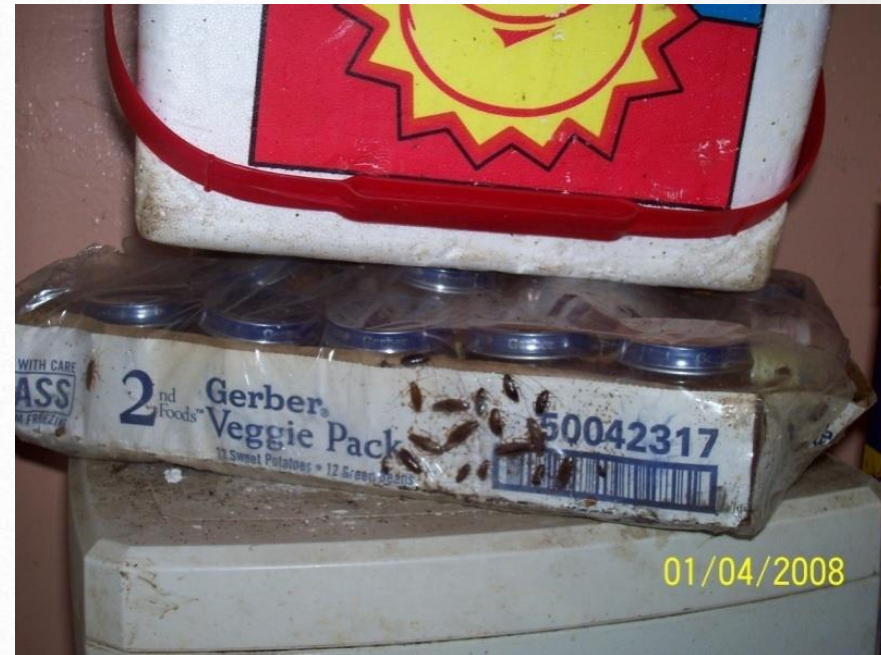
*Photo: City of Houston Bureau of Children's and Environmental Health*





## 5. PHYSICAL CONTROL

- Identify & assess problem
- Same strategy
- Different tactics – pest specific



*Photo: City of Houston Bureau of Children's and Environmental Health*





# REDUCE EXPOSURE

Choose safer products

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- Roach baits
- Gels
- Dusts
- Glueboards and Snap Traps



# ILLEGAL AND RISKY PESTICIDES

- Pesticides that look like candy - mothballs
- “Miraculous” Chinese Insecticide chalk
- “Tres Pasitos”
- Many pesticide have been withdrawn



↑  
candy!



# FEDERAL PESTICIDE LAW

- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- Administered by EPA
- Pesticide – Broad term
- No pesticides are safe – some are low-risk
- The label is the law





# ARE THESE LABELS?



# EPA PESTICIDE PRODUCT LABELS

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- Product Name
- EPA Reg. No.
- Ingredients
  - ◆ Active
  - ◆ Inert / Other
- “Keep Out of Reach of Children”
- First Aid
- Net contents



**Signal Word:**  
Caution  
Warning  
Danger

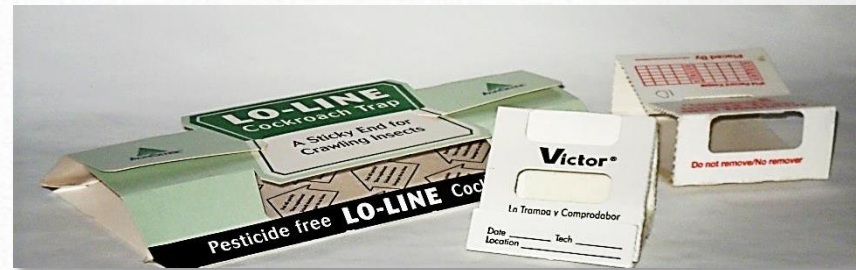
Poison – skull & crossbones





## 6. MONITORING

- Keep looking for pests
- Spot reinfestations
- Place in corners
  - ◆ Behind appliances
  - ◆ Under sink
  - ◆ Under cover!
- Do date & mark
- Don't disturb





# MONITORING FOR RODENTS

- Similar to insects – use snap traps or glue-boards
- Place in corners, along runways, in tight dark spaces
- Check daily
- Increase trapping if monitors indicate activity
- Always have monitors for insects and rodents in place



Keep it Pest-Free

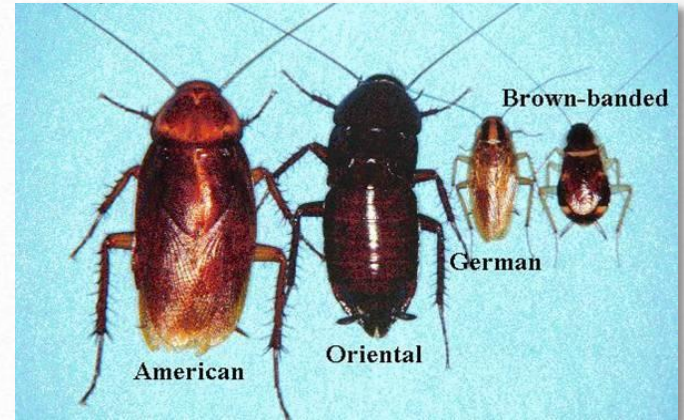
# KNOW YOUR PESTS





# COCKROACHES

- Identification & biology
- Life cycle:
- Diseases
- Key harborage sites



*Pest cockroaches of North America*

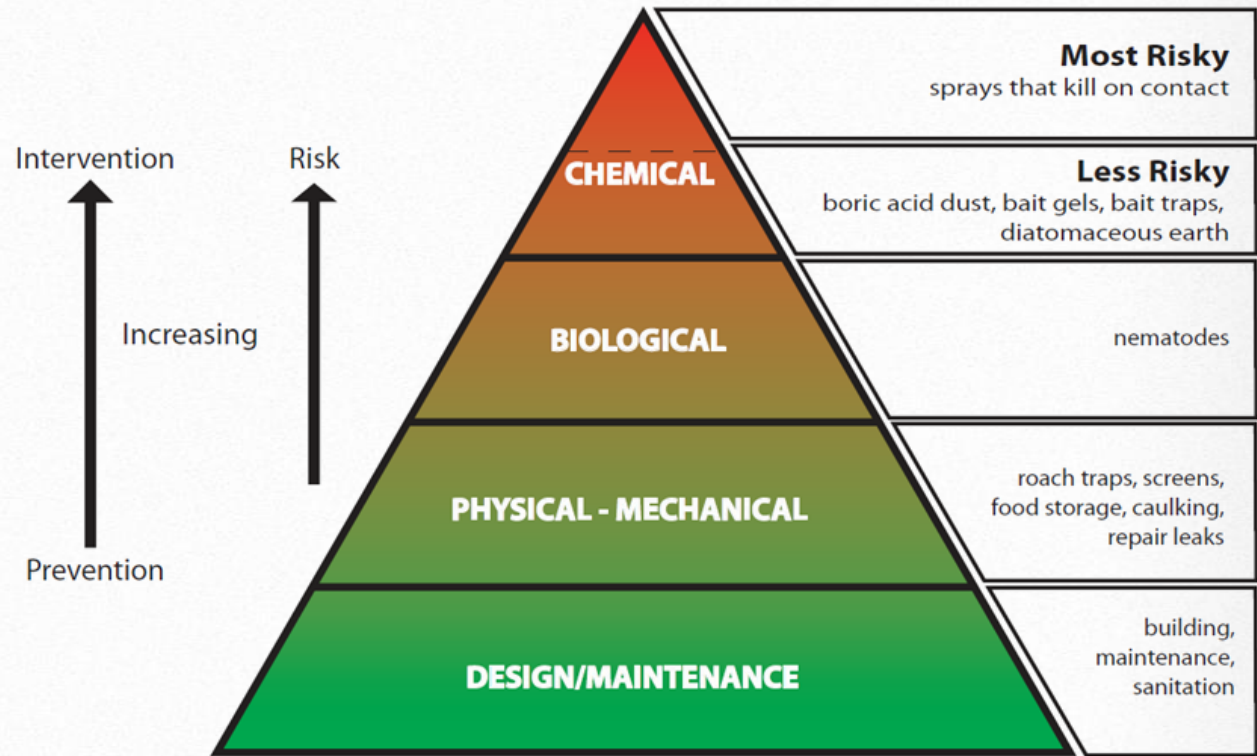


*German cockroach life cycle*





# HANDLING ROACHES THE IPM WAY



## Pyramid of IPM Tactics for Roaches





**Door**



**Behind  
wallpaper**



**Wall clock**



**Under a  
cabinet shelf**



**Behind the  
wall clock**



# COCKROACH CONTROL

- Habitat modification
- Monitors
- Dust and caulk
- Baits and gels
- Insect growth regulators
- Sticky traps





# RODENT CONTROL

- Rodents are mammals like us
- Think like a rodent
- Not all rodents are the same
  - ◆ Mice – curious & persistent
  - ◆ Rats – cautious & smart
  - ◆ Squirrels - outdoors



# RODENT IDENTIFICATION

- **House Mouse**

- Also: White Footed, Deer

- **Norway Rat**

- **Brown rat, Wharf, Sewer, etc**

- **Roof Rat**

- **Black rat**

- Also: Cane rat, etc.

- **Squirrel**

- **Groundhogs, etc.**



large

large

FEET

HEAD

small

small



**Young Rat**



*Mouse feces*

1/4"



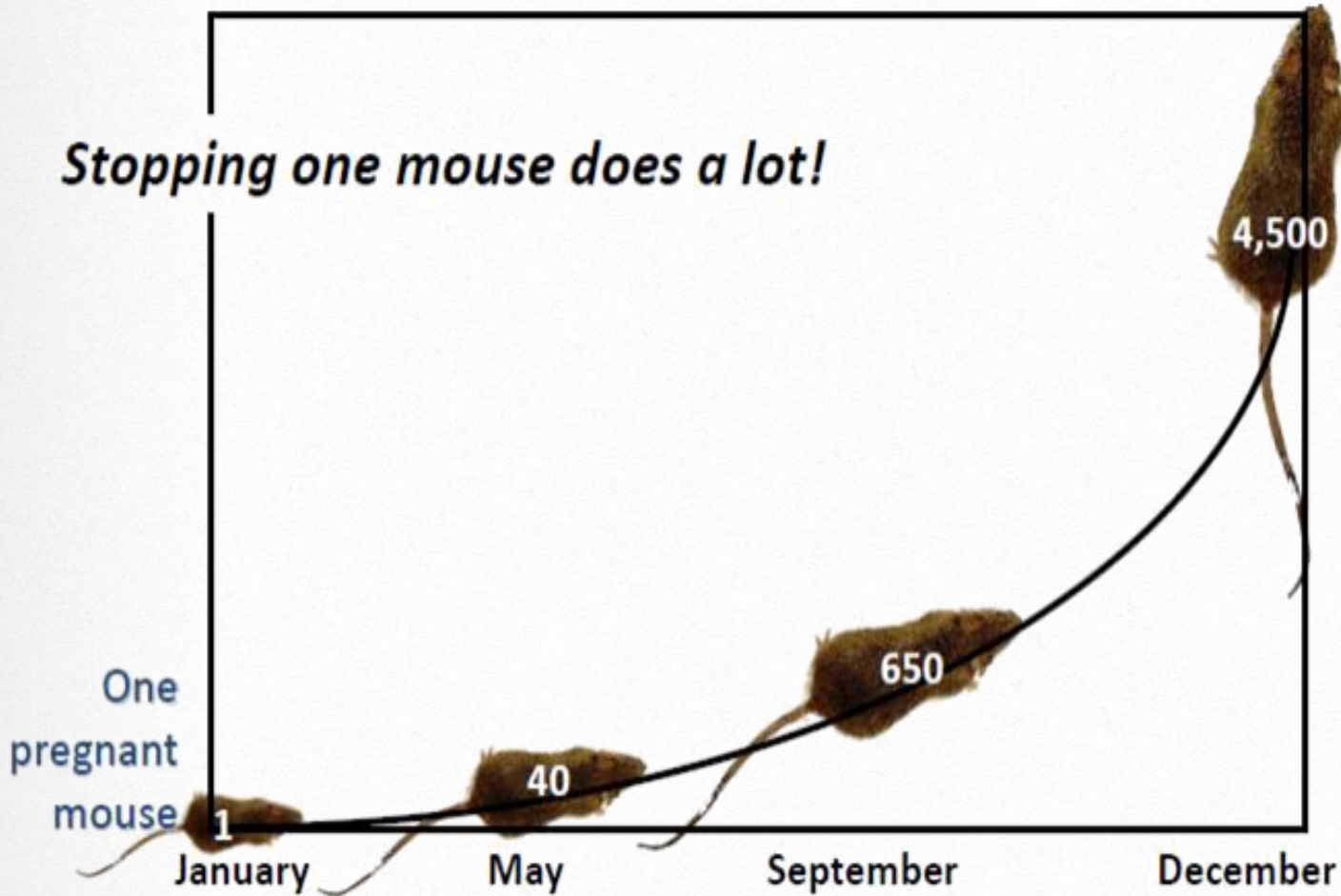
*Rat feces*

3/4"

**House Mouse**



# RODENT REPRODUCTION







Demo

# HOW TO TRAP A RAT AND A MOUSE





# THINGS THAT DON'T WORK

- Contact sprays
- Foggers
- Mothballs
- Ultrasonic's
- Dryer sheets, etc.





# THINGS THAT MAY WORK, BUT...

- Essential oils and cleaners
- Carbon dioxide traps
- Kerosene
- Homemade traps and gadgets
- What have you seen?



# BED BUGS - DON'T PANIC

- Can be avoided and eliminated
- Every skin irritation or bite is not bed bugs
- You can see them.
- Do not cause or spread diseases.
- Heat and/or steam can kill them.
- Protocols and communication key to control



# BEDBUGS

- Identify properly – don't assume
- Life cycle



*Photo credit:  
Changlu Wang & John Obermeyer/Rutgers University*





# BEDBUGS - CONTROL

- Exclusion
- Preparation
- Traps – interceptors



www.PestProJoe.com © 2006



Center Well

Outer Pitfall



# BED BUG - TREATMENT

- Inspection
- Vacuum
- Heat or cold
- Pesticides by PCO only
- Re-inspection & retreatment
- Encasements & interceptors



# CODE REQUIREMENTS

## Code requirements related to pests

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- Extermination
- Infestation
  - ◆ 308.1 Infestation
- 302.5 Rodent harborage
- 304.14 Insect screens
- 308.2 Owner
- 308.3 Single occupant
- 308.4 Multiple occupancy
- 308.5 Occupant.





# RESOURCES

- Cooperative Extension Services
- State Pesticide Regulator for Pest Control Applicators/Operators
  - ◆ Often at universities
- [www.ehw.org](http://www.ehw.org)
- [www.nchh.org/Training/IntegratedPestManagementIPM.aspx](http://www.nchh.org/Training/IntegratedPestManagementIPM.aspx)



# KEY MESSAGES

- Pests can create allergens and be vectors of disease.
- Control of pests through pesticides can lead to poisonings and other neurological problems.
- Some pesticides found in homes have been banned.
- Make house less hospitable for pests. Prevent entry, control food, water, and places for shelter.
- Integrated Pest Management is the recommended strategy.



# LEARNING OBJECTIVES

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