

Basics of IPM in Schools



SCHOOL INTEGRATED PEST MANAGEMENT
CENTER OF EXPERTISE

TODAY'S PRESENTERS



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- **Mark Hardin** is an Integrated Pest Management (IPM) Specialist for the Howard Co. MD Public School System.



- **Dr. Marc Lame** is a Clinical Professor at Indiana University's School of Public and Environmental Affairs and the Director of their MS Environmental Science Program



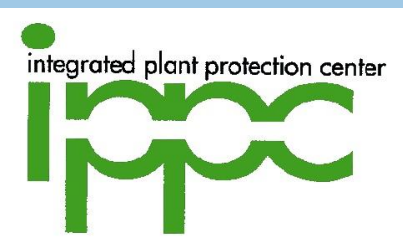
Dr. Marcia Anderson is with EPA's School IPM Center of Expertise in Dallas, Texas.



BASICS OF SCHOOL INTEGRATED PEST MANAGEMENT



Tim Stock,
School IPM Program Coordinator, Integrated
Plant Protection Center



Many thanks to the following for the use of their photographs: Carrie Foss, Washington State University; Vonnie Good, Salem-Keizer School District; Dawn Gouge, University of Arizona; Marc Lame, Indiana University; Alexandre Latchininsky, University of Wyoming; and Ricardo Zubiato, Salt Lake City School District

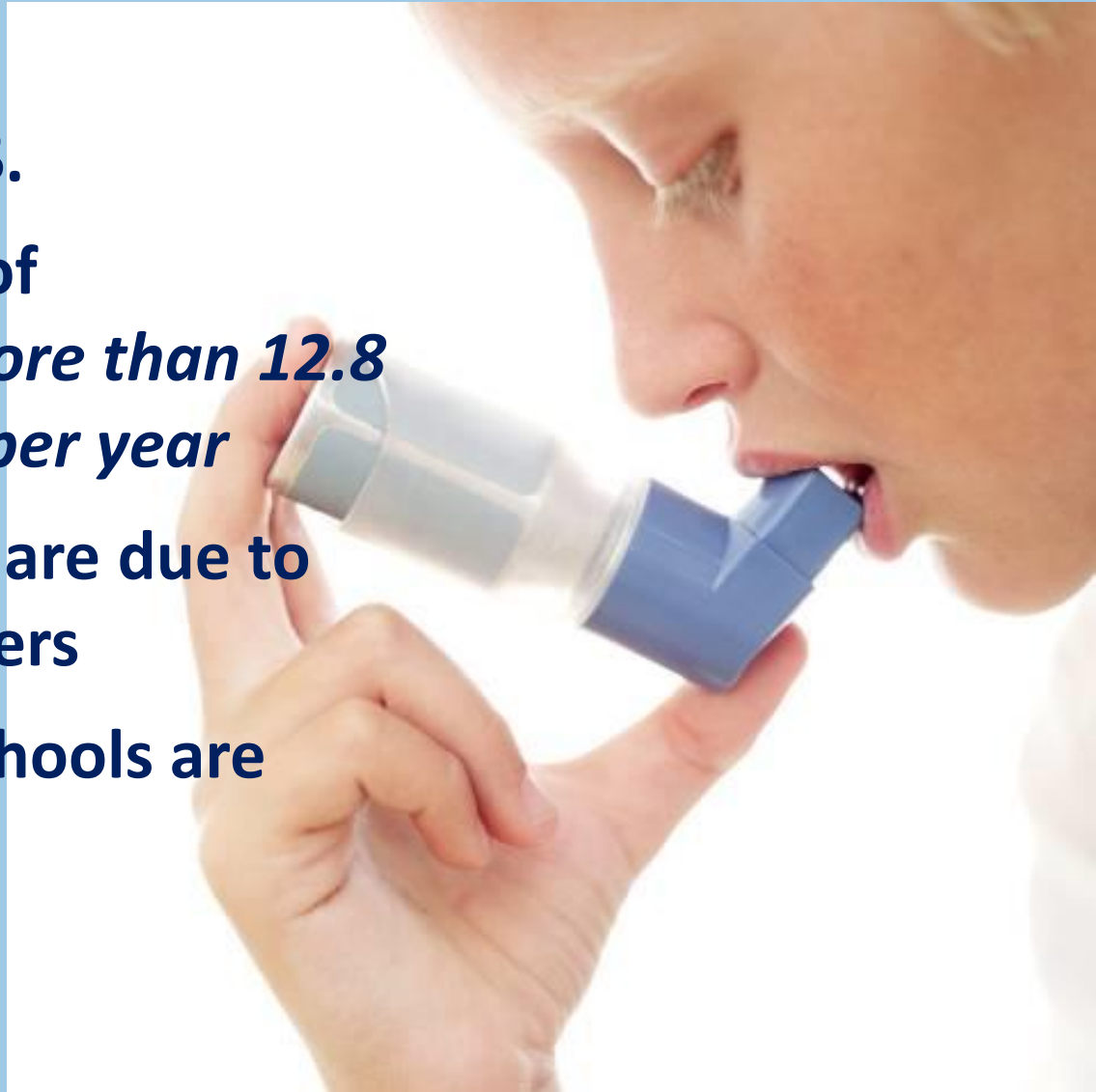
PESTS AND PESTICIDES IN SCHOOLS ARE AN ENVIRONMENTAL HEALTH ISSUE

- Children are especially vulnerable to problems associated with some pests
- Cockroaches are asthma triggers
- Rodent infestations can be disease vectors, asthma triggers
- Pesticides commonly used (*and misused*) can be asthma triggers (especially aerosols)
- Some pesticides have been associated with other short and long-term health problems



ASTHMA IS THE MOST COMMON CHRONIC ILLNESS IN CHILDREN

- 4.8 million kids - U.S.
- Number one cause of absenteeism – *more than 12.8 million school days per year*
- Most exacerbations are due to environmental triggers
- Common pests in schools are triggers



THE HOUSE MOUSE CAN HURT YOU

- **3,000 microdroplets per day:** Urinary proteins of the house mouse are asthma triggers
- **65 droppings per day:** “Thus salmonella longevity in fecal pellets is sufficient to present a potential contamination risk in the absence of an active infestation.” (Hilton, et al. 2002. Int. J. Environ. Health Res. 12)
- **Lymphocytic choriomeningitis (LCMV):** Relatively resistant to drying and therefore humans can become infected by inhaling infectious aerosolized particles of the urine, feces, or saliva.



CONVENTIONAL CONTROL METHODS OFTEN HAVE UNRECOGNIZED IMPACTS

- Monthly pesticide applications: Environmental contamination, health risks to children



- Unsanctioned use by well-meaning teachers, parents, and coaches: Environmental contamination, negative health effects to children

Unrecognized – short and long-term health problems often mistaken for something else

HEALTHY BUILDINGS, ACTIVE LEARNERS

Healthier Environment →

Healthier Children →

= Higher Academic Achievement !

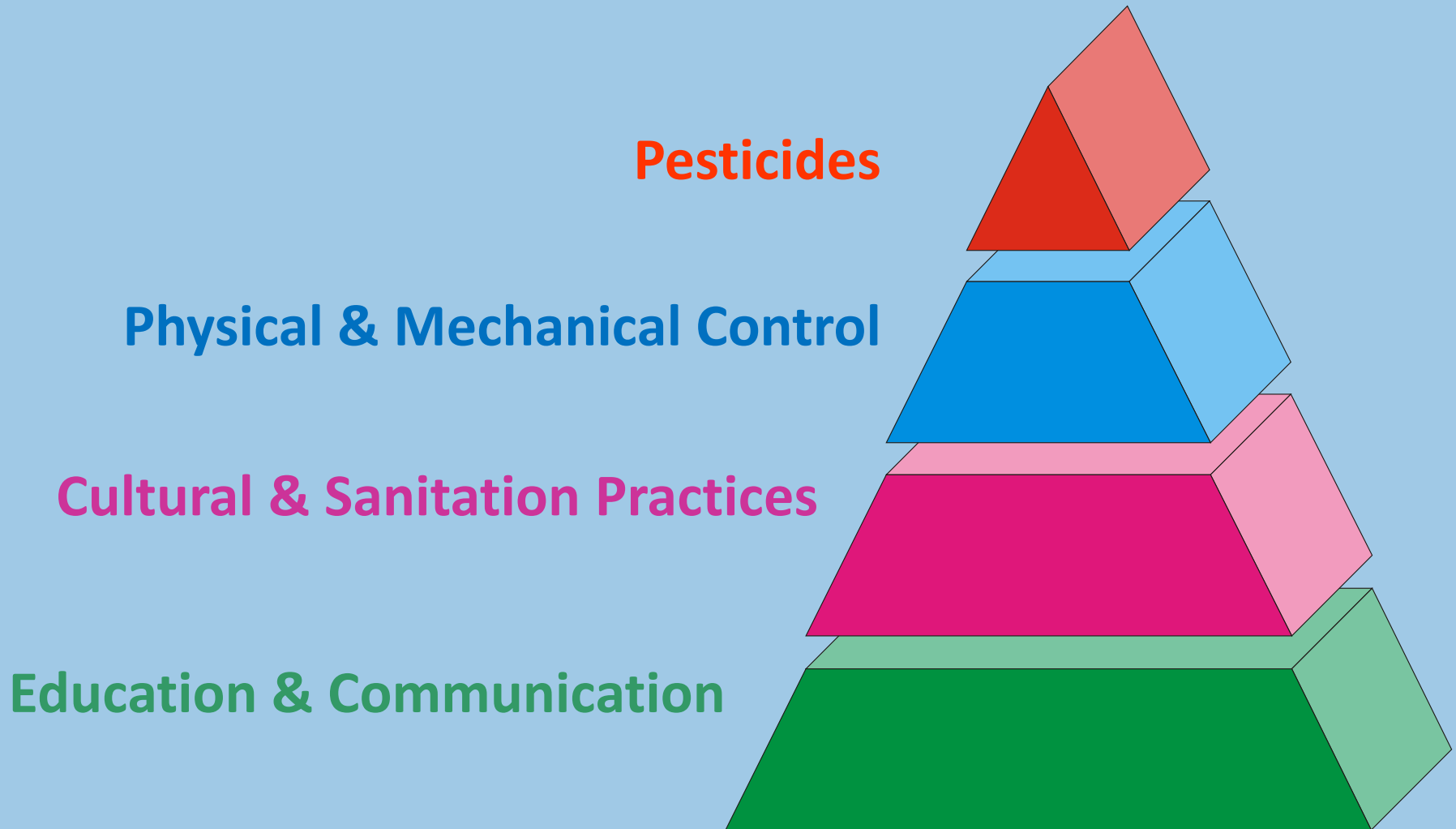


So what does this have to do
with “Integrated Pest
Management”?

WHAT IS “INTEGRATED PEST MANAGEMENT” (IPM)?

- **Common-sense strategy integrating multiple tactics**
– does not rely on a single tactic
- **Long-term solutions (it’s a process, not a magic bullet)**
- **Focus on minimum impact on human health and the environment**
- **Solutions based on understanding pest biology and behavior**

IPM BASICS

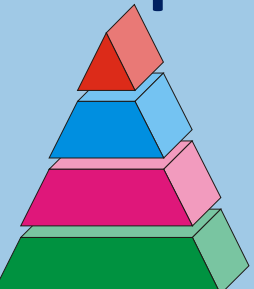


IPM

- Common-sense strategy
- Long-term solutions
- Better understanding of pests
- Low impact on human health & the environment

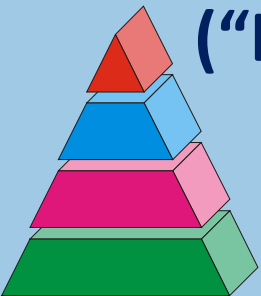
IPM IN SCHOOLS: KEY CONCEPTS

- **Inspection, monitoring and identification of pests**
- **Prevention and avoidance through pest exclusion and good sanitation**
- **Treatments focus on minimum impact on health and the environment.**
- **Custodians, teachers, students, principals, pest management professionals, and others all have a role**



THE PROMISE OF IPM IN SCHOOLS

- **71% Reduction in pesticide use**
- **78% reduction in pest-related work orders**
- **Reduced asthma triggers, reduced absenteeism**
- **Lower costs as pest problems are reduced (IPM implementation requires initial investment)**
- **No increase to workload of school facilities staff (“Do what you’re already doing, just think pests.”)**



IN OTHER WORDS...

- **Don't attract pests** (pests need food, water, shelter)



- **Keep them out** (pests need an entrance)



- **When you do have them, get rid of them in the safest way possible** (least risk to people and the environment)

WHAT'S THE DIFFERENCE BETWEEN IPM AND WHAT WE'RE DOING NOW?

Element	Conventional Pest Control	Integrated Pest Management
Education, knowledge	Minimal	Extensive
Inspection & monitoring	Minimal	Extensive
Emphasis	Treat <u>symptoms</u> of problem, and/or routine pesticide applications.	Treat <u>causes</u> of problem. Pesticides used only rarely.
Insecticides in occupied spaces	Sprays and aerosols	Baits, gels, dusts, IGRs, etc.
Application of sprays or fogging	Surface treatments	Generally avoided or crack and crevice only
Sanitation and exclusion for rodent control	Minimal	Extensive
Lethal control of rodents	Emphasis on rodenticides	Emphasis on trapping
Program strategy	Reactive	Preventive
Potential liability	High	Low

WHY WE NEED INTEGRATED PEST MANAGEMENT



All creatures require food, water and shelter to survive.

Pests find buildings where these needs are met and take up residence.

Block pests out and remove their sources of food, water and shelter and you will need fewer pesticides to control pests.

INSPECTIONS

- Inspect from a pest's perspective
(think “**food, water, shelter**”)



WHAT ARE YOUR PEST THRESHOLDS?

- **At what point does a school administrator determine if there is a real pest problem?**
- **When is it time to call a pest control company?**
 - **1 ant found?**
 - **5 ants found?**
 - **20 ants found?**

MONITORING → REPORTING → ACTION PROTOCOL



Seen any rodents, bugs, or "conducive conditions" lately?
Please jot down your observations for us!

Appendix 3

Appendix 3, Version 2.0 Last edited 8/23/11



Integrated Pest Management

Pest Log: **KITCHEN**

Report of Pest Sighting				Respondent	
Date	Name	Location in the kitchen	Pest/Problem Description	Action Taken and Cost (if any)	Initials & Date

“Pest Logs” to report and record pest problems and action taken to manage them

STICKY TRAPS FOR MONITORING INSECTS

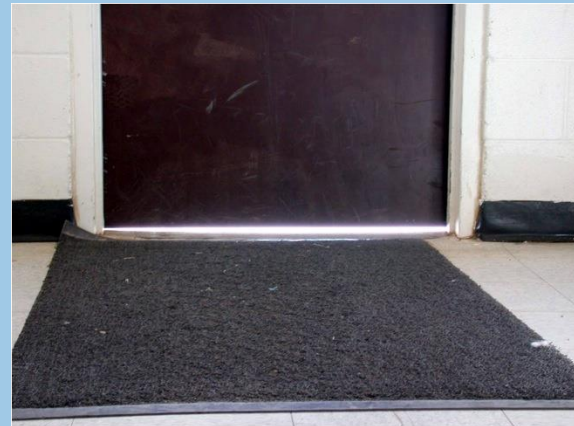
- No protocol for setting and reviewing sticky traps
- = No useful information



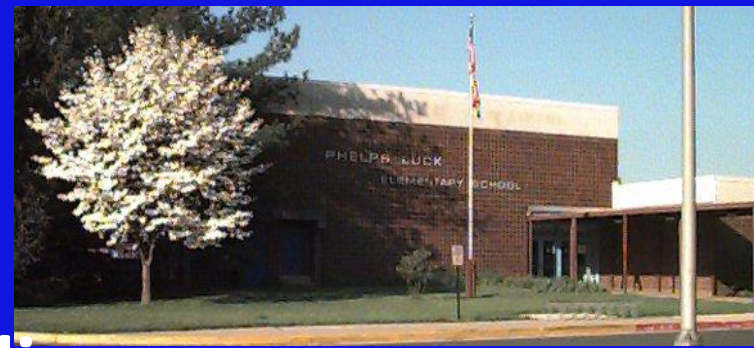
PREVENTION AND AVOIDANCE THROUGH SANITATION AND EXCLUSION



- Pests need food, water and shelter



- Pests need an entrance



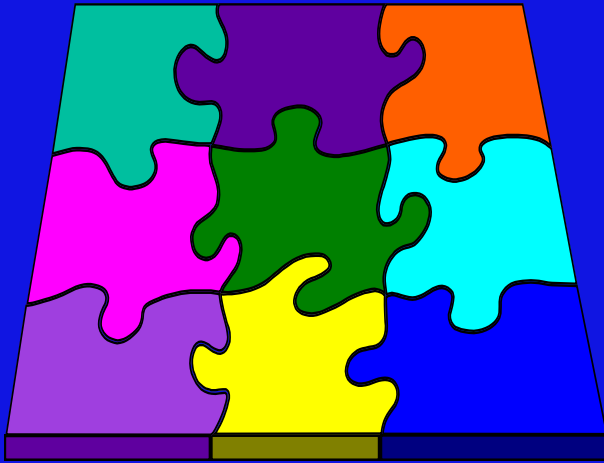
Mark R Hardin IPM Specialist Howard County Public Schools



Smithsonian Institution



Defining Integrated Pest Management



- IPM= A monitoring based pest management program which emphasizes exclusion, sanitation, and habitat modification.
- When pest problems are identified, and control is necessary (thresholds are met), the least toxic effective control tactic is used.

THIS PRESENTATION WILL (BRIEFLY) COVER:

PEST IDENTIFICATION: A NECESSARY SKILL

MONITORING: SCHEDULE AND TIPS

EXCLUDING PESTS: ITS NOT THAT HARD!

THINK GOOD MAINTENANCE!

SANITATION: IT'S WHY THE PESTS WANT IN – FOOD!

MAINTENANCE: SEE EXCLUDING PESTS ABOVE!

WHAT ARE YOU “LOOKING” FOR?

- **Actual Pest – need the pest to identify it**
- **Signs of Pest – droppings, damage, shed skins, tracks, evidence of nesting**

WHAT DO WE DO WITH WHAT WE FIND?

- **Identify it to species if possible, or take a sample**
- **Record it in a pest log, or visitation report**
- **Make recommendations for resolving the problem: sanitation, trapping, maintenance issues**

WHAT IS MONITORED ROUTINELY?

Monthly monitoring/ Inspection:

- Kitchen/cafeteria
- Break rooms/ Staff Lounges
- Physical plant areas
- Family Science/Home Economics
- Anywhere food is stored or eaten
- Problem areas reported since last visit

WHY ELSE MIGHT YOU INSPECT?

- **To determine if monitoring is working**
- **To check traps placed during monitoring**
- **When the pest is especially dangerous or may be a health risk**
- **When you need to be sure what is going on at the school**
- **Regulatory visits**
- **When the problem is not resolved**
- **When you are called back by staff**

**WHO ARE YOU GOING TO CALL
TO CONTROL THE “BLOOD-
SUCKING CONENOSE BUGS?”**



Why ID pests? Because not knowing the correct pest name leads to wasted time and unnecessary treatments.

NOPE! LEAF-FOOTED BUG!!

Don't Design buildings to invite pests into your schools!



Weep Vents





et™
**WEEP
VENT**

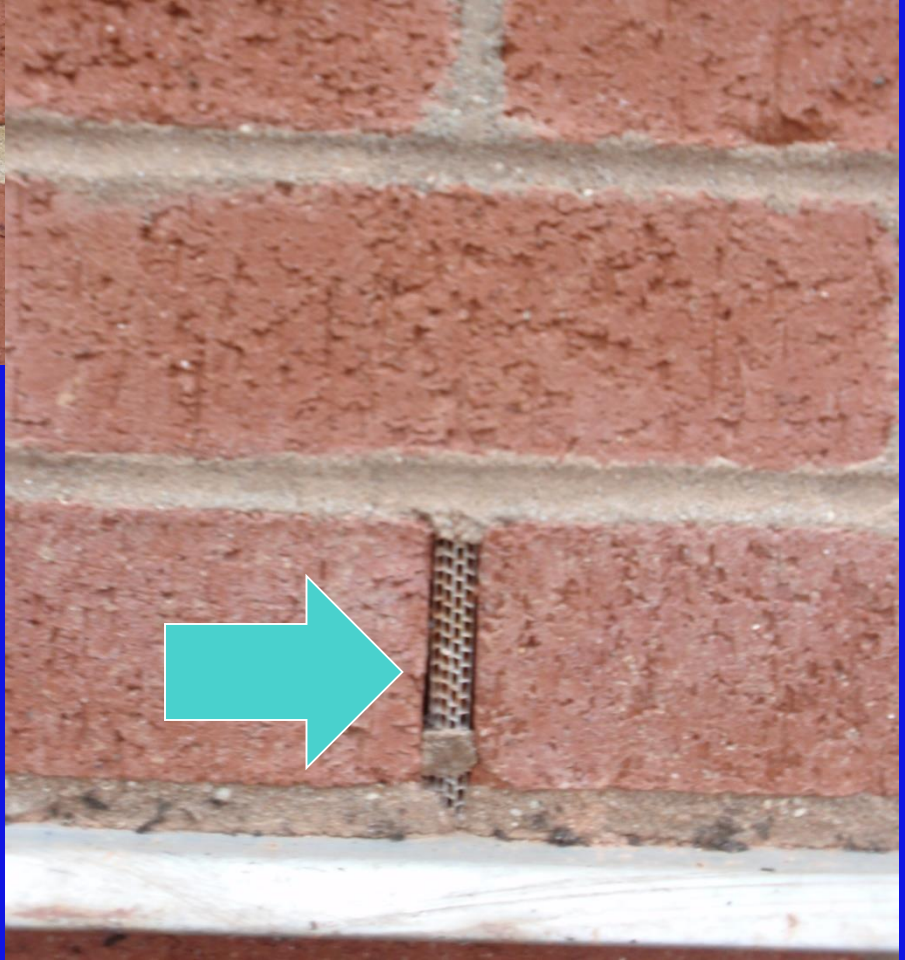
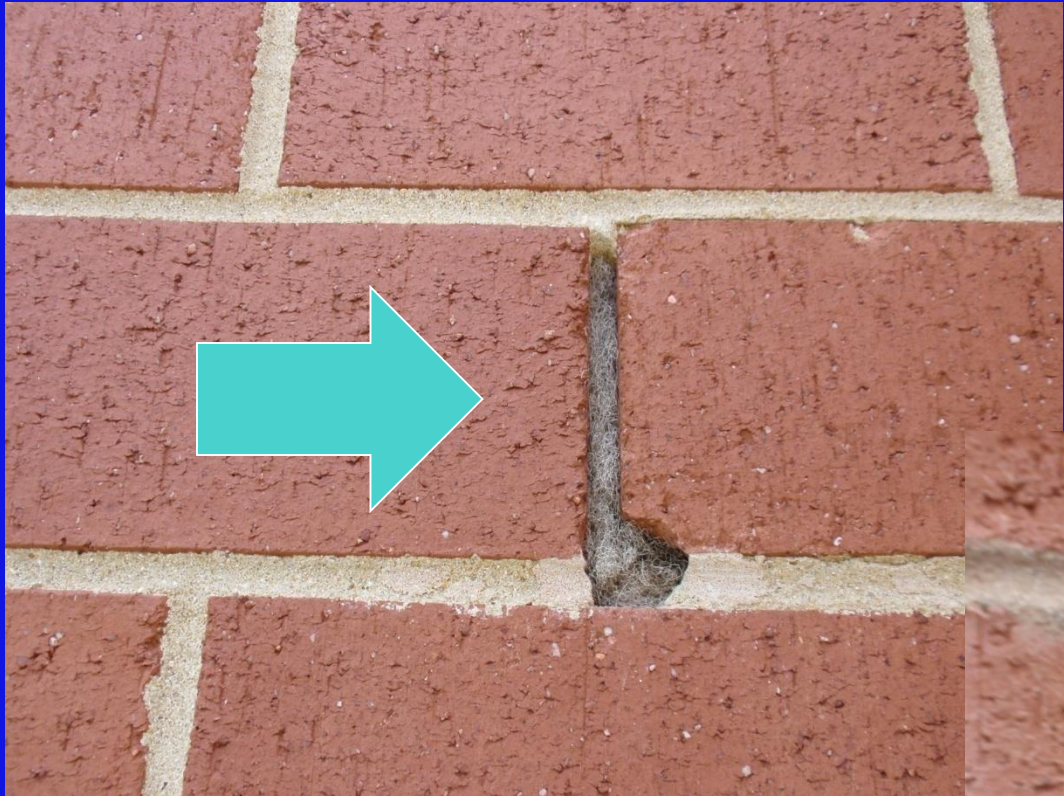
Avoid Cavity Wall Drainage Problems with

MORTAR NET WEEP VENTS™



Maximize the Life and Add to the Beauty of Masonry







THOROUGH INSPECTION IS CRITICAL

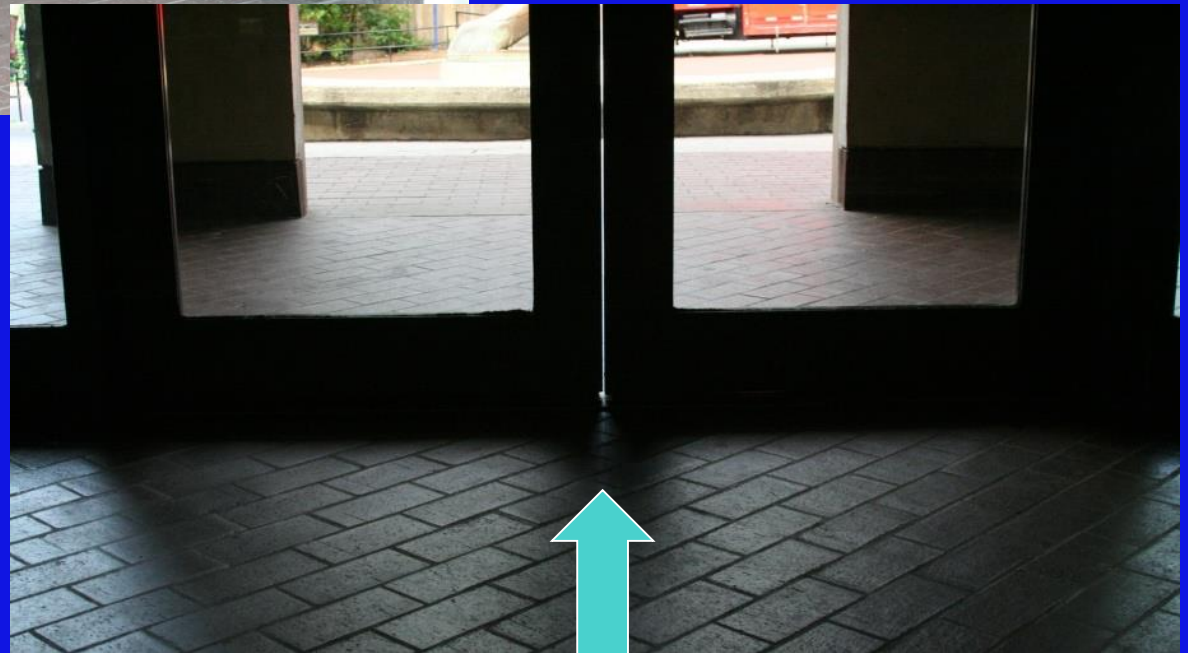
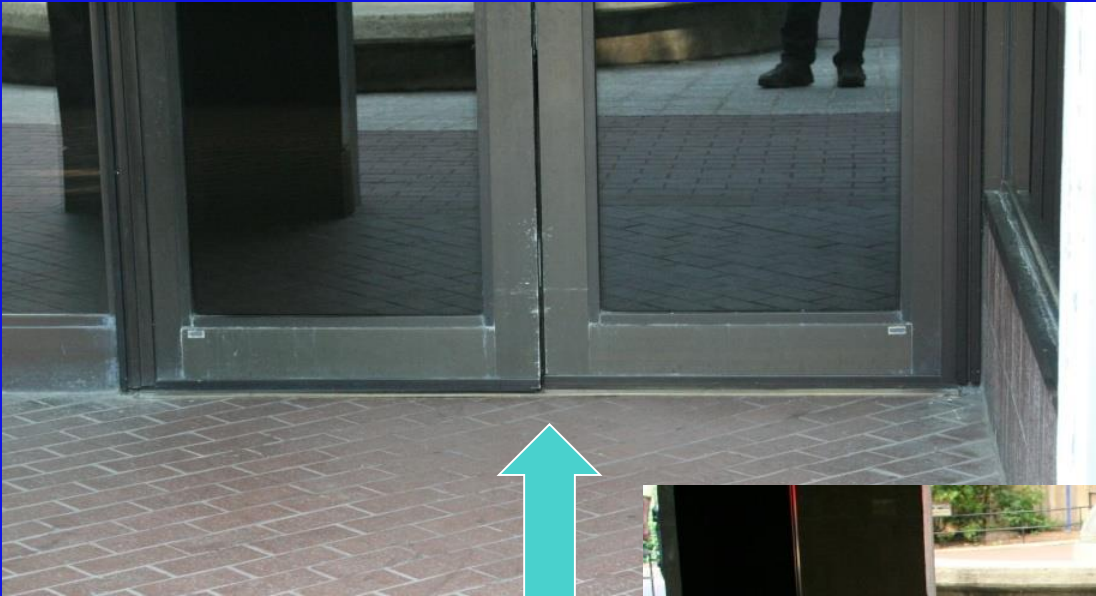


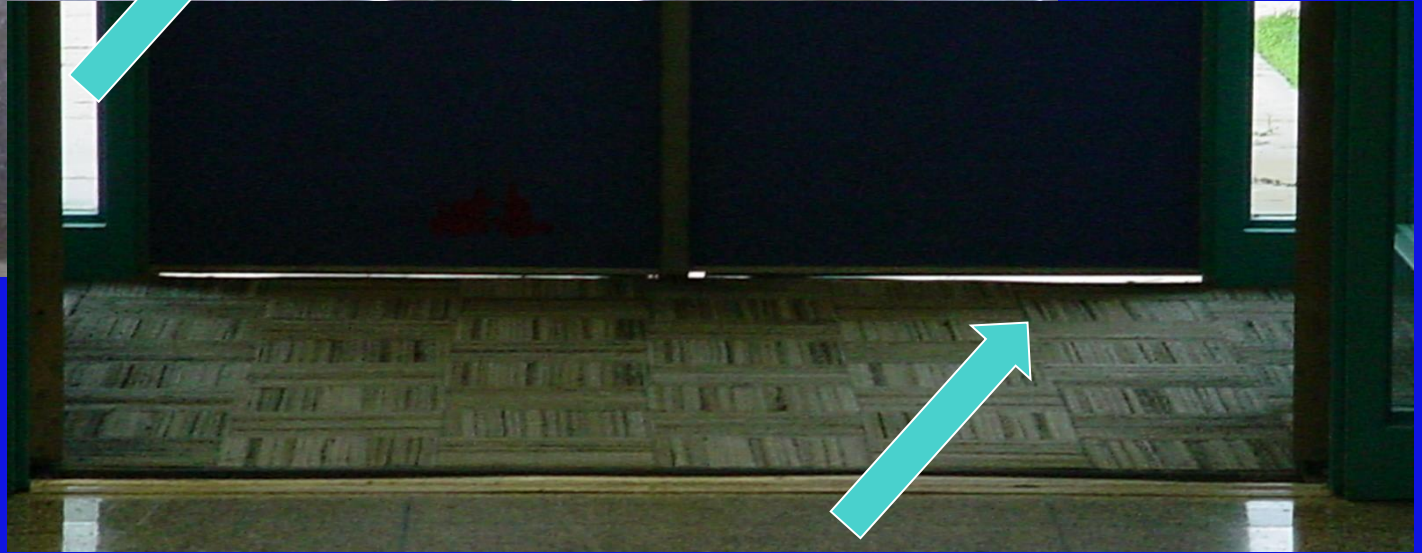


WHY IS THIS DOOR PROPPED OPEN?



INSPECTING DOORS





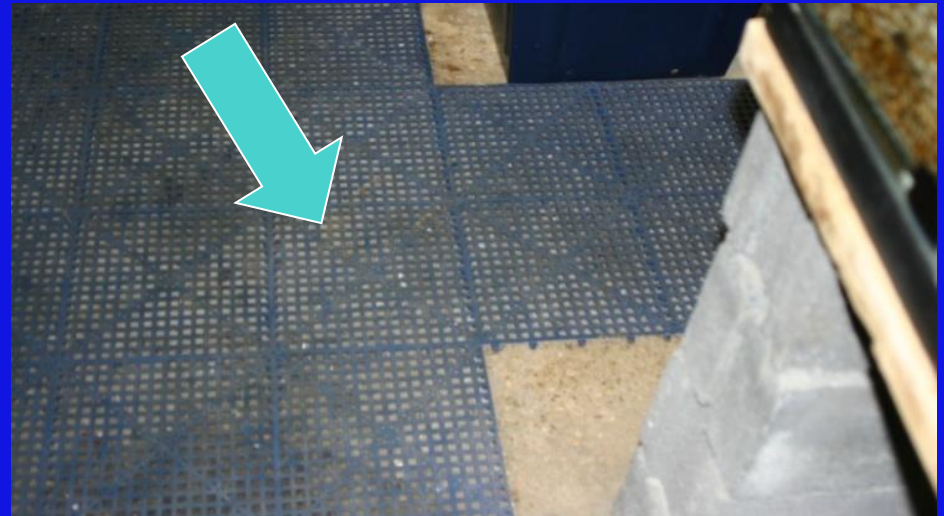
THRESHOLDS TO THE FUTURE: LOOKING DOWN ON THE PROBLEM





COMPLETE THE JOB...

A FIRM FOUNDATION: EDGES PROVIDE A PLACE TO TRAVEL AND HIDE



DRAIN ISSUES





PROPER BUILDING MATERIALS?



BRILLIANT IDEAS?



UTILITY INSTALLATIONS





CHASING
PIPES





**PIPE CHASES SHOULD BE SEALED
WITH APPROPRIATE MATERIALS**

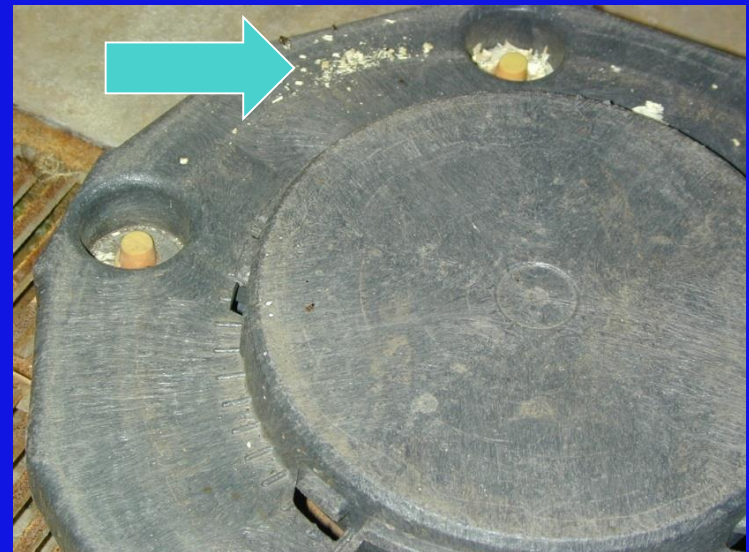


Slide courtesy of Marcia Anderson, EPA

TRASH BAGS KEEP FOOD FROM PESTS



SANITATION AND EXCLUSION





SANITATION ISSUES – DUMPSTER RECOMMENDATIONS



Dumpsters used for recycling materials need to be kept clean

Trash pick up schedules need to be often enough to keep trash away from pests



Trash that falls on the ground around dumpsters needs to be cleaned up



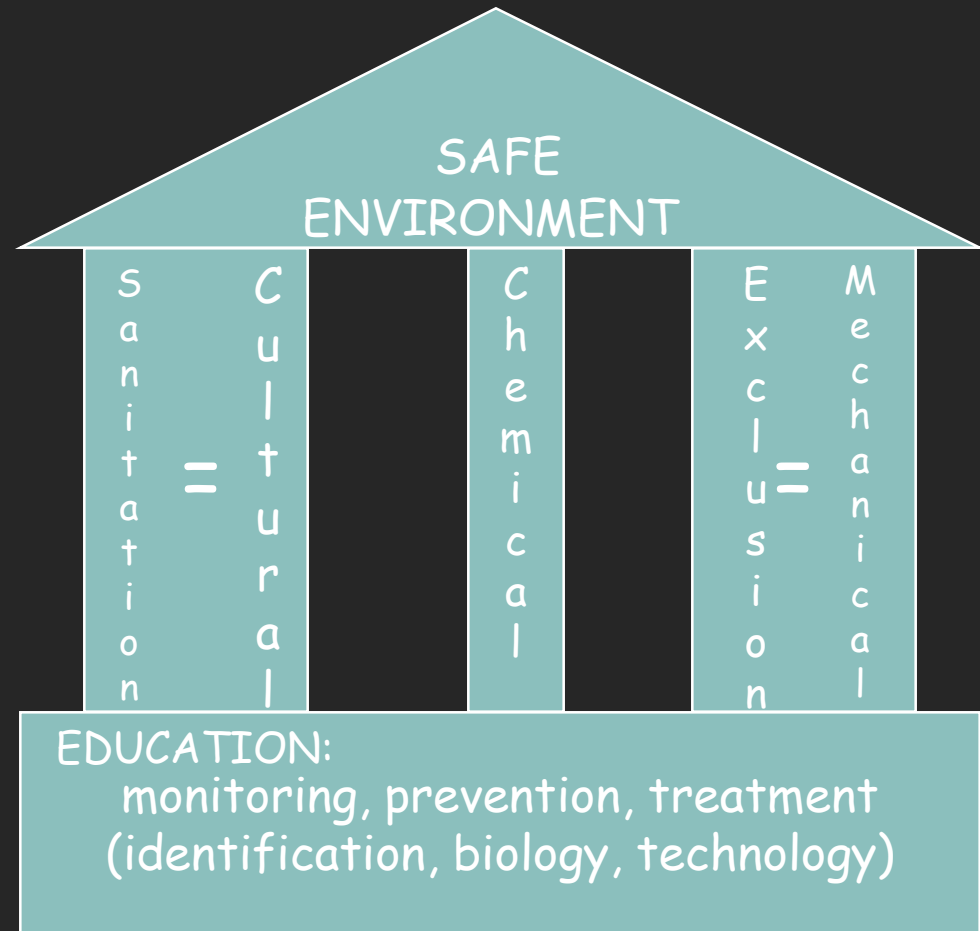
INTEGRATED PEST MANAGEMENT School Kitchens

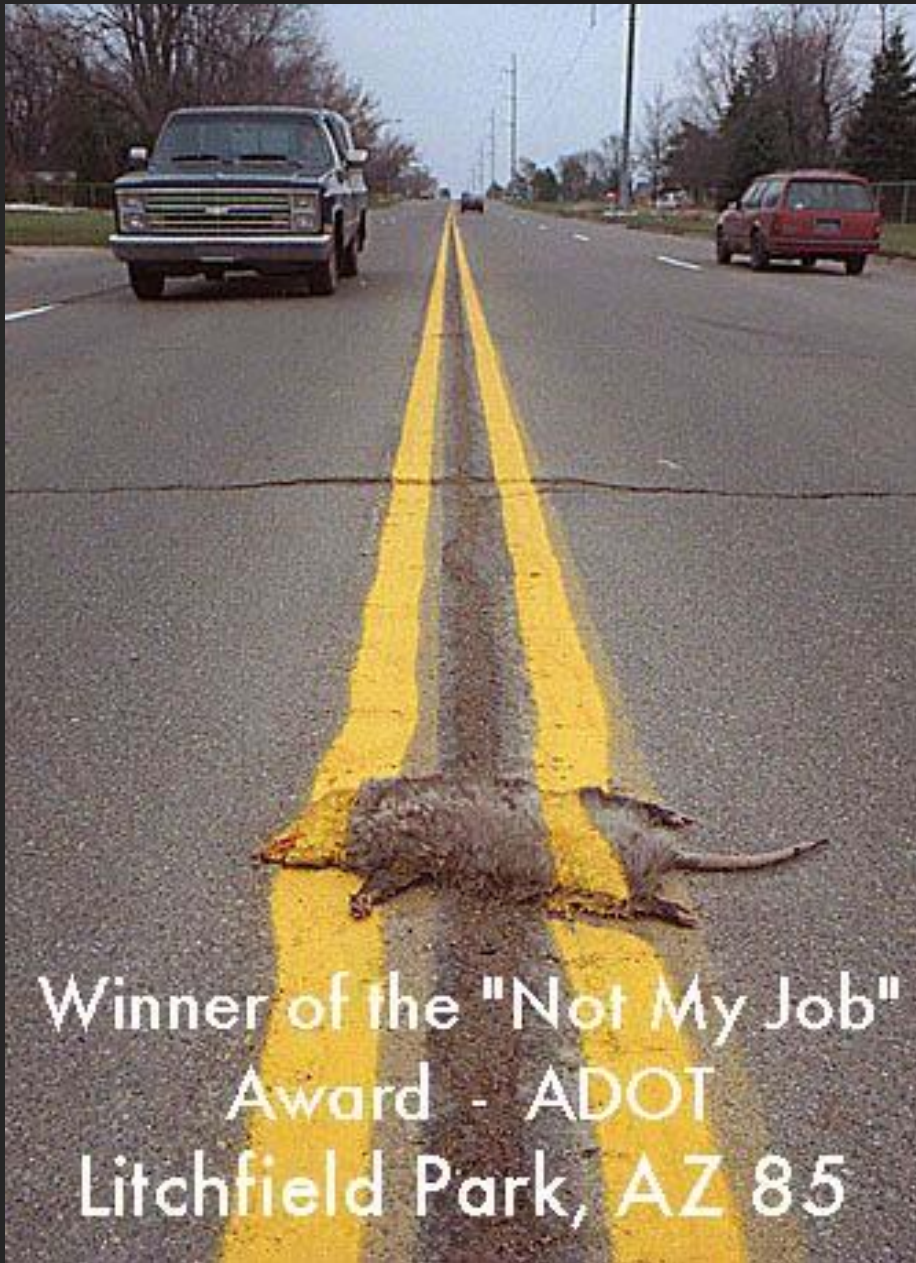
Dr. Marc Lame, Indiana University



IPM In The School Building

Fact: the vast majority of pest management activities are conducted by food service, custodial and building maintenance professionals....
NOT pesticide applicators





PEST
PREVENTION IS
EVERYONE'S
JOB

Winner of the "Not My Job"
Award - ADOT
Litchfield Park, AZ 85

OH, OH...MORE STUFF
ON MY PLATE..

So....."Do what you do
now---just think
pests!!!"

What Are All School Districts Doing These Days?

▣ Doing what you do now---just think pests!!!

- Security = monitoring
- Energy conservation = exclusion
- Sanitation = nothing to eat
- Clutter control = no place to live

Food Water Shelter



Don't attract Pests: Kitchen Cultural Control



KITCHEN SANITATION

- minimizing food, water and harborage for pests



Kitchen Sanitation - Are you Feeding Pests Where you Cannot See? The "back-leg zone"



KITCHEN / FOOD PREP AREAS



- ❖ All surfaces in food preparation and serving areas should be cleaned regularly and thoroughly (after each use).
- ❖ Ensure all cracks, leaks and moldings are sealed.

CAFETERIAS



- Clean up serving line spills.
- Thoroughly clean and dry trays and dish return areas.
- Properly clean dishwashing racks.
- Small amounts of water can sustain a pest population.



Keep them out: Mechanical/Physical

Excluding (pest proofing) pests using barriers, including screens, seals, nets and sealing

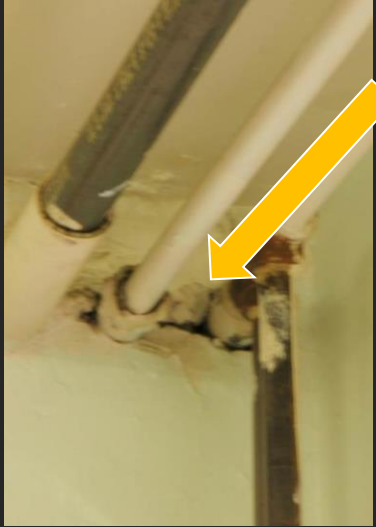


EXCLUSION

- Eliminate pest entry/migration points = "pest proofing"



KITCHEN PEST PROOFING



- Cover drain traps.
- Screen vent pipes.
- Flashing, floor drains, vents.
- Seal gaps around pipes.

FOOD STORAGE: CARDBOARD = COCKROACH CONDOS



Clutter = Shelter (Harborage)



Get rid of them, if you are sure you have them
with the safest, most effective method(s) –

- Mechanical –
 - Traps – mice, flies, misc.
 - Vacuums – spiders, roach clean out!
 - Heat & cold – stored product pests
- Pesticides
 - Chemical – synthetics and organics
 - Bio-Rational – B.t., pheromones, JHs
 - Abrasives – Diatomaceous Earth

Mechanical or physical control



Restaurant Fly Traps



- ☞ Manually removing pests using hands, snares or by vacuuming
- ☞ Setting traps, including sticky, electric, light, multiple catch and snap types
- ☞ The use of heat or cold to destroy pests

Moth Fly Requires A Shift In Strategies - Elbow Grease Vs. Pesticides



SELF APPLIED PESTICIDES ARE INAPPROPRIATE!



Kitchen Monitoring

- The only way to justify pesticide application
- Allows for proper diagnosis



Your Eyes 24/7...but Not Your Mind



MARC DEFINES THE PEST
MANAGEMENT PROFESSIONAL AS
AN:

“Diagnostician/educator”



PMP - "DIAGNOSTICIAN"

▣ Your "professional" relationship

- History

- Inspection for conducive conditions

- Inspection for pests & damage

- ID and biology

- monitoring



Perform Regular Kitchen Inspections



And What Is She Looking For?

Conducive Conditions:
those things that attract
pests and allow them to
be where you don't want
them.

KNOW WHERE TO LOOK?



Wet Places - Where Is Your Swamp?



MORE KITCHEN MOISTURE SOURCES

- Condensation under refrigerators.
- wipe dry or placed a pan under the appliance to collect water.
- The collection pan should be emptied frequently.



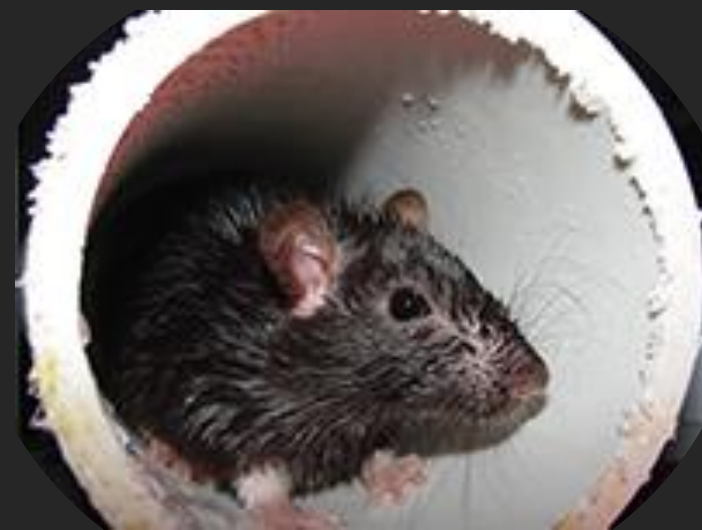
Warm Places - Where Is Your Jungle?



Tight Places - Where Is Your Bark?



Safe Places - Where Is Your Shelter?



Safe Places - Where Is Your Escape?



Dining Places - Where Is Your Food?



Waste Management Is Pest Management

KITCHEN STORAGE AREAS



- ❖ Keep food and beverages in tightly sealed containers.
- ❖ Bulk products should not contact walls or floors.
- ❖ Store paper goods separately and away from food.

POOPING PLACES - WHERE IS YOUR BATHROOM?



PMP - "EDUCATOR"

DEMAND a "professional" Partnership to teach your staff how to:

- ❁ To prevent pests
- ❁ Inspect for pests
- ❁ ID and biology
- ❁ Monitoring
- ❁ To Remove pests



RESULT - A Safe Learning Environment



SCHOOL PEST CONDUCTIVE AREAS INCLUDE:

- **Kitchen / food prep areas**
- **Cafeterias / eating areas**
- **Faculty rooms**
- **Classrooms / storage**
- **Restrooms**
- **Student lockers/ cubbies**
- **Gyms / locker rooms**
- **Custodial areas**
- **Waste disposal areas**
- **Basement**

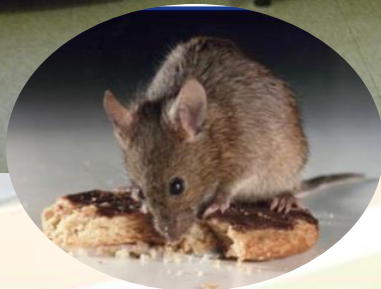


TEACHER'S BREAK ROOMS



- upholstered furniture may provide pest harborage
- clean and dry dishes daily
- remove food in cardboard boxes

VENDING MACHINES



- spilled or broken products attract mice and roaches
- ensure scheduled cleaning which may need to be negotiated contractually with the vendor
- monitor



OTHER EATING AREAS



- **Keep all eating confined to designated areas**
- **Thoroughly clean food serving tables and floor after each use**
- **Install pest monitors in any classrooms where food is served**
- **“Clean to the corner” - clean hard to reach spaces**
- **Sweep and mop after each meal**

FOOD STORAGE IN CLASSROOMS



- If food must be in the classroom:
- store in clear pest proof containers
- off of the floor
- Store food manipulatives properly

CLUTTER AND PESTS



- Clutter control is essential in classrooms to reduce pest habitats.
- Clutter enables pests to hide and reproduce undisturbed.
- Store materials in plastic storage boxes with lids.
- How organized and clutter free are the closets in your classrooms?

TAKE AWAY PEST HOMES

- **Recycle corrugated cardboard.**
- **Avoid using cardboard for storage.**
- **It is a favorite living-space for cockroaches and other pests.**



ELIMINATE CLUTTER / HARBORAGE



Clutter removal is an essential part of IPM and pest elimination



WHY DOES THIS CLASSROOM HAVE PESTS?



This is a real classroom!

PETS IN CLASSROOMS



Keep all pet food stored in plastic containers with clear plastic containers

Clean up spills promptly

Pet cages and aquariums must be kept clean

Check aquariums for water leaks

LIBRARIES AND BOOK STORAGE AREAS



Make sure that areas under bookcases and behind stored books can be inspected and cleaned on a regular basis.



CUBBIES, AND LOCKERS

- Cubbies, lockers and storage areas should be cleaned at least seasonally
- No food should be stored in cubbies or in lockers for more than a day
- Provide independent storage cubby areas for younger children



RESTROOMS

- clean rest rooms daily
- maintain plumbing in good repair – fix faucets and leaks
- keep sink areas clean and dry
- seal all holes around pipes
- tighten Escutcheon plates



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REMOVE PEST FOOD: WASTE MANAGEMENT



- **Employ good waste management practices:**
- **Indoor trash containers should be emptied frequently**
- **Trash cans should have lids**
- **Do not leave trash cans full overnight**
- **Keep trash cans clean both inside and out**
- **Use child-friendly cans in rooms with young children**



GYM AND LOCKER ROOMS



Student gym lockers should be cleaned out daily to reduce moisture



CUSTODIAL MOP ROOM



- To reduce pest harborage in custodial closets:
- hang mops upright and allow to dry
- keep sinks and buckets empty and dry when not in use
- floor and sink drains should be kept clean

CUSTODIAN'S CLOSETS AND STORAGE



- Utilize appropriate shelving practices
- Keep clean and clutter-free
- Remove all cardboard



- Do not store boxes or cardboard on the floor
- monitor

BASEMENTS: A CLOSER LOOK

- Inspect



BASEMENTS



Moisture – Standing water



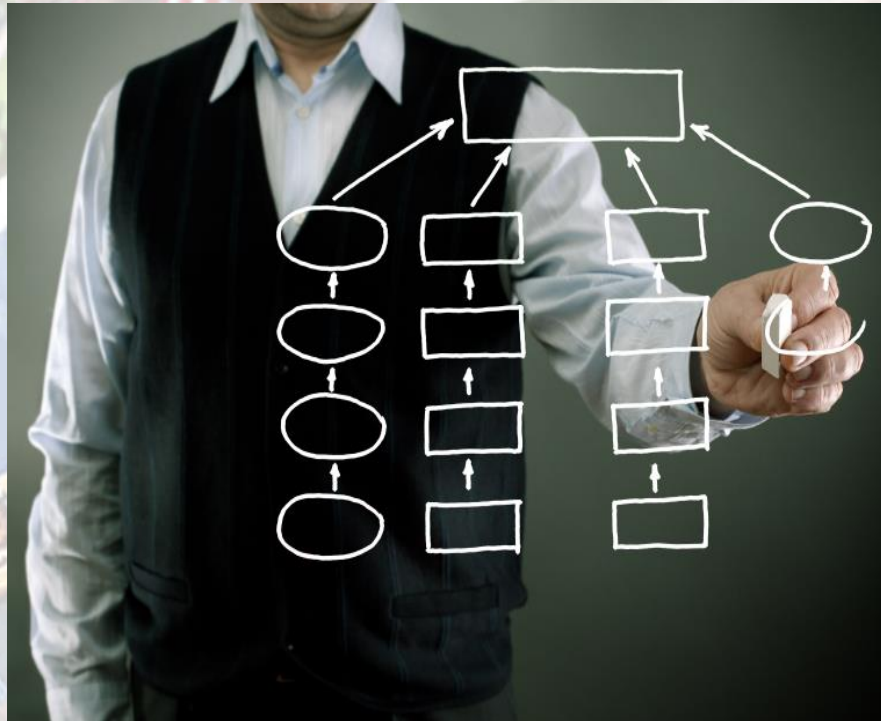
BASEMENTS



Seal those holes!



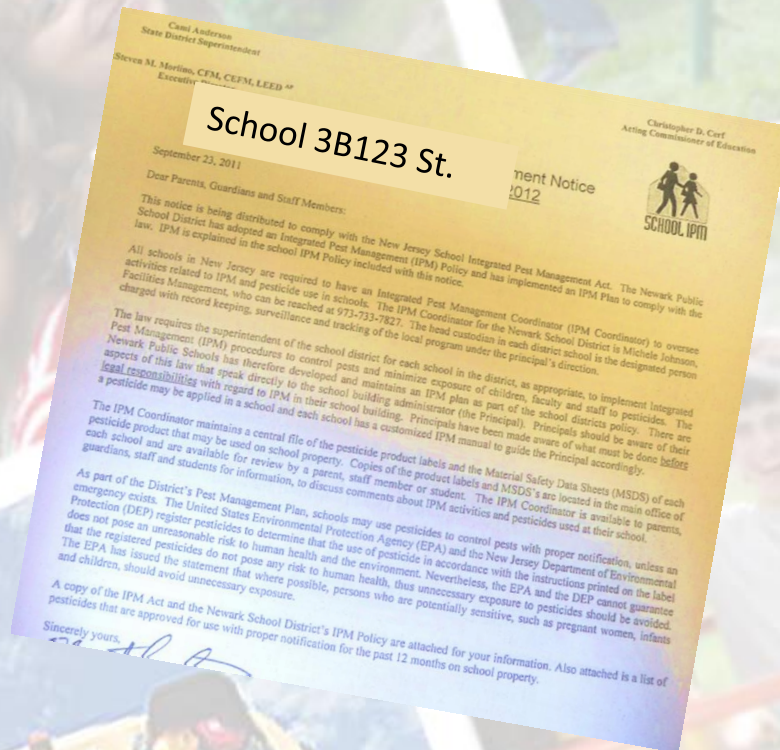
ESSENTIAL INGREDIENTS FOR A SCHOOL IPM PROGRAM:



- IPM Plan
- IPM Coordinator
- Staff involvement
- Pest Identification
- Assessment of Pest Issues
- Inspection and Monitoring
- **Managed Treatment**
 - Use multiple control tactics.
- **Education**



DISTRICT AND SCHOOL IPM POLICY



- We suggest that every school have an IPM Policy.
- The IPM policy should be sent home to all parents annually.
- It should also be posted in in a common area.

SCHOOL IPM PLAN

A school IPM Plan should:

- **Outline IPM guidelines to follow.**
- **Be site-specific.**
- **Have statements monitoring, inspections, establishing thresholds, who can apply pesticides, how problems should be reported.**
- **Who should be educated about IPM.**
- **be adopted by the school board.**



THE FACILITY IPM COORDINATOR:



- **Oversee day to day pest problems.**
- **Is responsible for maintaining the school.**
- **Relies on employees to report needed repairs or pest problems.**
- **Maintains all pesticide application records.**
- **Ensures notice of pesticide treatments to parents and staff.**
- **Is the main contact to the pest management company.**



REPORTING PESTS

Service Complaint Log

PEST SIGHTED	AREA PEST WAS SIGHTED	PERSON REPORTING PEST	CORRECTIVE ACTION BY BOWCO	BOWCO TECHNICIAN	DATE COMPLETED
Brown Bugs in cafeteria	slot sink in cafe slop sink	J. Porter Sr. east	Treated w/ Gel	B. McMickle	01/25/12
Bedbug	Rm. 323 on student	J. Porter	Inspection	B. McMickle	01/25/12
Bugs looks like brown house roaches	4 th floor 3 rd floor slop sinks	J. Porter	INSPECTION	B. McMickle	02/03/12
Bedbug	419 412	J. Porter	Inspection	B. G. fel	2-7-12
Said bedbug was in student bag	323	Teacher Rm 323			
		J. Porter			

Sight & Log

- Contact the IPM Coordinator.
- We suggest creating a sequential system to report pest complaints and building problems.

Pest sighting and service logs should be kept by the school food service, IPM coordinator and grounds manager. Make accessible to inspectors, staff, and others.

PESTICIDE APPLICATION NOTIFICATION

The EPA suggests Pesticide Application Notification

Notify parents or guardians and staff prior to application of any non-low impact pesticide treatments both inside or on school grounds.



EVALUATE PEST MANAGEMENT OPTIONS

- Consider all pest management options, including:
- No action at all.
- Non-pesticidal pest management methods.
- Consider using low impact pesticides first.
- Use pesticides if other methods of pest control are not effective.

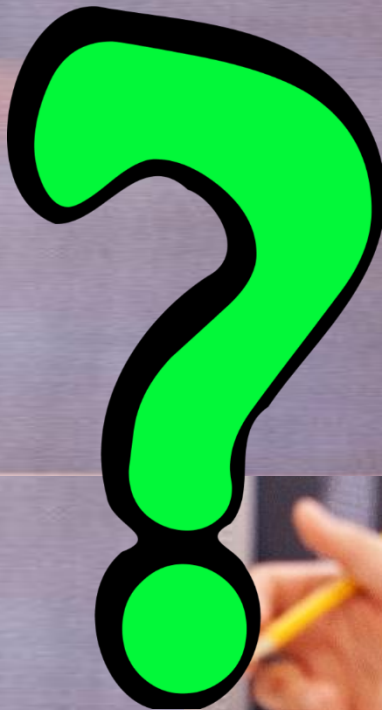


BENEFITS OF SCHOOL IPM

- **Smart:** addresses the root cause of pest problems and provides a healthier learning environment for children
- **Sustainable:** better long-term control of pests
- **Savings:** reduces energy costs and may reduce pest management costs



QUESTIONS ON THE BASICS OF INTEGRATED PEST MANAGEMENT IN SCHOOLS



school.ipm@epa.gov

Center of Expertise for School IPM

