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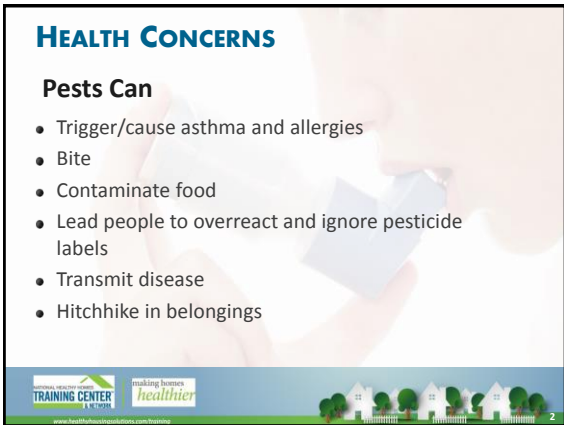
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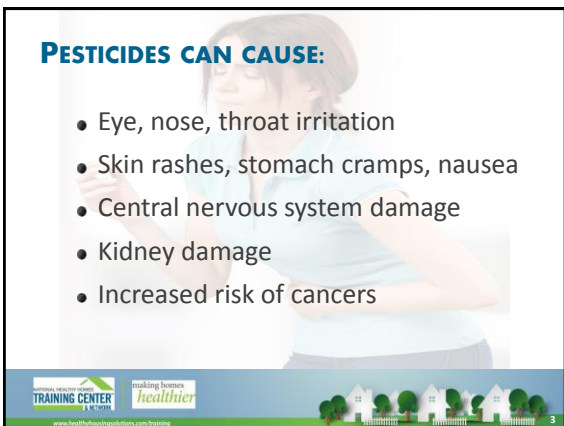
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### WHAT ALL PESTS NEED



- Food
- Water
- Date (another pest)

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### INTEGRATED PEST MANAGEMENT

- Keep them out and give them no place to hide
  - Change surrounding landscape
  - Block pest entries, passages, hiding places
- Reduce food availability
  - Practice proper food storage and disposal
  - No dirty dishes in the sink overnight
  - Clean crumbs, grease etc.
- Knock down population
  - Traps
  - Appropriate pesticides

www.healthpropestmanagement.com/Training

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### PEST CONTROL

- No spray and fogging for roaches
- Monitoring pest populations and complaints
- Reduce asthma triggers

www.healthpropestmanagement.com/Training

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www.healthpropestmanagement.com/Training

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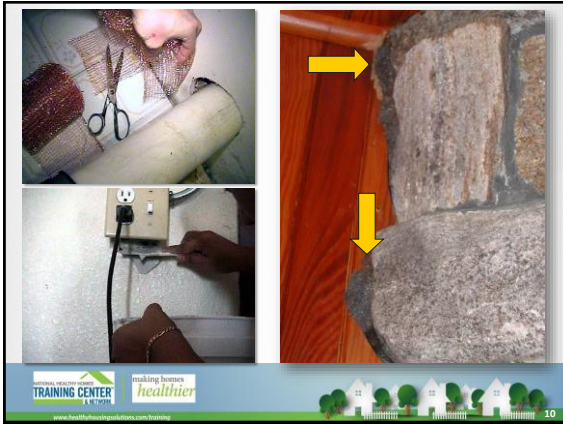
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### CONTAMINANTS AND HEALTH ISSUES

Contaminant	Health Issue
Lead and lead-based paint	learning difficulties, neurological problems
Environmental tobacco smoke	lung cancer, heart problems, SIDS
Radon	Lung cancer
Asbestos	cancer, mesothelioma
Volatile Organic Compounds	breathing issues, allergic reactions, headaches
Formaldehyde (a VOC)	respiratory issues, nasal cancer
Carbon monoxide	death, fatigue, headache

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- ### LEAD AND LEAD-BASED PAINT
- Peeling, Chipping Paint / Deteriorated Paint
  - Dust
  - Soil
  - Drinking water
  - Consumer Products such Pottery, Cribs, Jewelry, Candle Wicks
  - Cultural Items
  - Contaminated Sites

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### WHY LEAD?



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### WHY AVOID LEAD?

- Reduced IQ
- Learning disabilities
- Impaired hearing
- Reduced attention spans, behavior problems
- Anemia
- Kidney damage
- Damage to central nervous system
- Coma, convulsions, death

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*Peeling paint outside*

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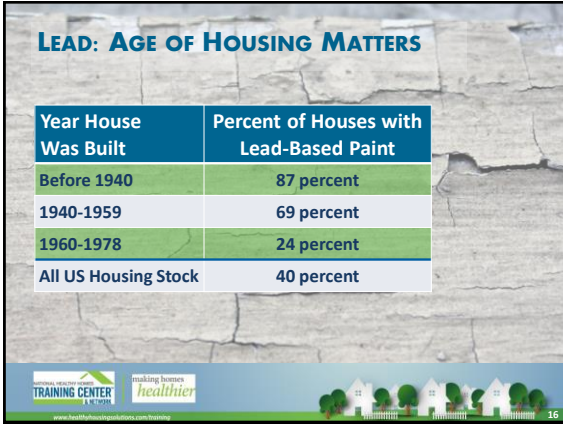
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### LEAD: AGE OF HOUSING MATTERS

Year House Was Built	Percent of Houses with Lead-Based Paint
Before 1940	87 percent
1940-1959	69 percent
1960-1978	24 percent
All US Housing Stock	40 percent



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### PREVALENCE OF DETERIORATED PAINT


2011 American Housing Survey

2.1%

*of homes have broken plaster or peeling paint*

Conditions that Deteriorate Paint

- In past twelve months,
  - 8.5% of homes had interior water leakage
  - 11% of homes had exterior water leakage



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17

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### AVAILABLE TESTING

- Paint
- Dust - Clearance testing
- Bare soil
- Drinking water



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## EPA RRP RULE

### Renovation, Repair and Painting (RRP) Rule

- Effective April 22, 2010
- Pre-1978 housing (target or child-occupied)
- Triggers
- 40 CFR 745.80 to 745.91
- April 22, 2008 Federal Register



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## AUTHORIZED STATES

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*States have been authorized to administer and enforce the RRP Rule.*



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## IMPACTS OF RRP RULE

- 8.4 million renovation events annually
- Required certification of firms and individuals



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### SUMMARY OF CHANGES FROM RRP

- “Certified Renovation Firm” Disturbs Paint
- “Certified Renovators” Supervise Work
- Mandatory Work Practices
- Post-renovation Cleaning Verification
- Documentation!



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### HOW CLEAN IS CLEAN?

- Clearance testing is required for jobs receiving HUD funding and as the clients requests



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### A NEW BOOKLET



Only for Leases and Sales of Target Housing



For Renovations in Target Housing and Child-occupied Facilities



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## LEAD DISCLOSURE

- For property transfers
- For rentals



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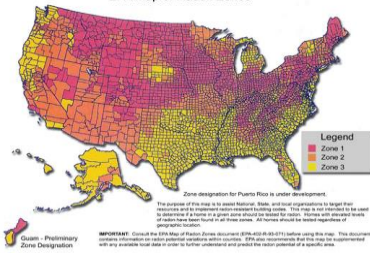
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## EPA RADON ZONES

EPA Map of Radon Zones



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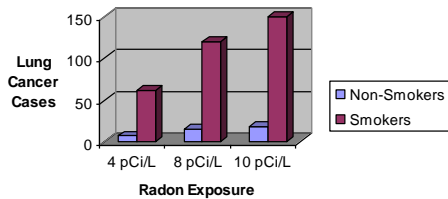
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Estimated Lung Cancer Cases in a Population of 1,000 (US EPA, 2005)



✓ 1/15 homes may have an elevated radon level (above EPA action level of 4 pCi/L).



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### RADON PRECAUTIONS – COVER SOIL



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### RADON MITIGATION COSTS

New Construction	Average Costs
- Passive only	\$350 - \$500
- Active system	\$650 - \$800
Existing Homes	\$800 - \$2,500

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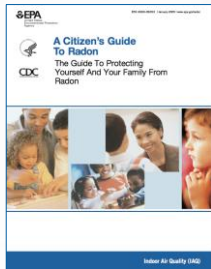
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### RESOURCES

- EPA Home Buyer's and Seller's Guide to Radon
- EPA Citizens Guide to Radon
- State resources



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### ASBESTOS USES



The slide features four images illustrating asbestos uses: a large pipe wrapped in asbestos, a house with asbestos siding, floor insulation between wooden joists, and a green asbestos wall panel. The slide includes logos for 'TRAINING CENTER' and 'making homes healthier' at the bottom.

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### ASBESTOS – HEALTH EFFECTS

- Asbestosis
- Lung cancer
- Mesothelioma
- Smokers are at greater risk!



The slide lists health effects of asbestos and includes an image of a hand holding a piece of asbestos. The slide includes logos for 'TRAINING CENTER' and 'making homes healthier' at the bottom.

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### CONCERNS FOR ENERGY UPGRADES

- Disturbing insulation
  - ◆ Pipes
  - ◆ Vermiculite
- Consider vermiculite testing
- Precautions during blower door testing; pressurize vs. depressurize



The slide lists concerns for energy upgrades, including disturbing insulation (pipes and vermiculite), testing for vermiculite, and precautions during blower door testing. It includes an image of floor insulation. The slide includes logos for 'TRAINING CENTER' and 'making homes healthier' at the bottom.

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## VOLATILE ORGANIC COMPOUNDS

- EPA found concentration of VOC's to be 2-5 times greater in the home.
- During or immediately after paint stripping activities, VOC levels can be 1,000 times higher than outdoors.



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## VOLATILE ORGANIC COMPOUNDS

- Air Fresheners
- Cleaning Products
- Sprays & Coatings
- Wood Products
- Carpets
- Vinyl Floors
- Hobbies
- Home Maintenance



38

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## WHY AVOID VOCs?

- Potential health effects:
  - Eye, nose, throat irritation
  - Headaches, nausea, coordination
  - Liver, kidney, and brain damage
  - Some can cause cancers
  - Child development



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### POTENTIAL VOCs AND CONTAMINANTS DURING ENERGY UPGRADES

Potentially Created	Possibly Brought in During Work
Lead Hazards	Cleaning Products
Carbon Monoxide Hazards	Spray Foam
Elevated Radon Levels	Paints, Coatings, Flooring
Elevated Vocs & Formaldehydes When Homes Are Air Sealed	Pressed Wood Cabinets and Products - Renovation
Spread Of Pest Droppings Or Molds During Air Sealing Or Insulation	Removal or Installation of Insulation

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### FORMALDEHYDE

- Pressed wood, adhesives containing urea-formaldehyde (UF) resins
  - ◆ Cabinets; particle board
  - ◆ Hardwood plywood paneling



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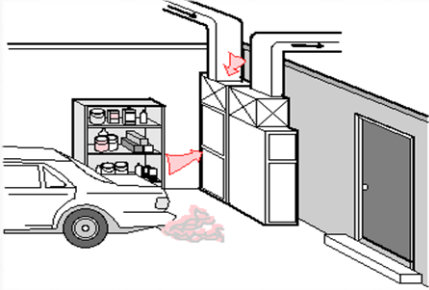
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### GARAGE SOURCES



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### STEPS TO CONTROL VOCs

- Control the source
  - ◆ Avoid using products that contain VOCs
  - ◆ Use lower VOC options (i.e. paints)
  - ◆ Seal containers; store far from air intake
  - ◆ Remove unwanted products from home
- Ventilate
  - ◆ - Open doors and windows, run fans
- Seal between garage and home, avoid air handlers or duct work in garage



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### THIRD-PARTY CERTIFICATIONS

- Buildings
  - ◆ Green Communities – [www.greencommunitiesonline.org](http://www.greencommunitiesonline.org)
  - ◆ Energy Star with Indoor Air Package – [www.energystar.gov](http://www.energystar.gov)
  - ◆ LEED for Homes – [www.usgbc.org/LEED/homes/](http://www.usgbc.org/LEED/homes/)
- Products and Services
  - ◆ Green Seal – [www.greenseal.org](http://www.greenseal.org)
  - ◆ EcoLogo - [www.ecologo.org](http://www.ecologo.org)
  - ◆ EPA's Design for the Environment – [www.epa.gov/dfc](http://www.epa.gov/dfc)
  - ◆ GreenShield Certified (for pest control) – [www.greenshieldcertified.org](http://www.greenshieldcertified.org)



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### INDUSTRY STEWARDSHIP PROGRAMS

- Understand the Motivations & Research the Options
- Examples
  - ◆ QualityPro Green for Pest Management – [www.qualityprogreen.org](http://www.qualityprogreen.org)
  - ◆ Green Label for Carpet and Rugs – [www.carpet-rug.org](http://www.carpet-rug.org)
  - ◆ Environmental Stewardship Program for Kitchen Cabinet – [www.greencabinetsource.org](http://www.greencabinetsource.org)
  - ◆ Ingredient Communications for Consumer Chemicals – [www.cspa.org/public/media/info/cpici.html](http://www.cspa.org/public/media/info/cpici.html)
- Other Programs



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## INSULATION

- Vermiculite
- Dust particles
- Some new concern with worker risks and spray foams




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**HAVE YOU READ THE MSDS?**  
BEFORE USING ANY SPRAY POLYURETHANE INSULATION PRODUCT YOU MUST...

**READ AND UNDERSTAND THE WHOLE MATERIAL SAFETY DATA SHEET (MSDS)**

Sections 1, 2, 3 <b>CHEMICAL IDENTIFICATION HAZARD WARNINGS COMPOSITION</b>	Do you know what you are handling? • Color • Odor • pH • Solubility • Other Catalyst, etc.
Section 8 <b>PERSONAL PROTECTION</b>	Are you using the correct Personal Protection Equipment? • Job • Respirator • Eye Protection • Gloves • Boots?
Section 9 <b>HAZARDOUS RELEASURES AND HANDLING</b>	Are you storing and handling the chemicals as directed? • Do you know how to properly contain and clean a spill?
Section 4 <b>FIRST-AID</b>	What should you do if there is an accidental exposure? • Do you know first-aid procedures? • Do you have first-aid materials at the work site?
Sections 5, 9-10 <b>OTHER INFORMATION "READ THE ENTIRE MSDS"</b>	Did you know that other information is provided on an MSDS? • Physical Hazards • Stability and Reactivity • Toxicology • Disposal • Transportation and • Regulatory Information?

**Change to SDS**

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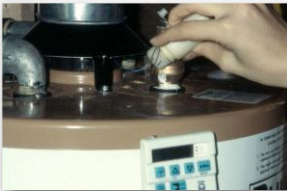
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## CARBON MONOXIDE

Test Combustion Equipment: BPI or Equivalent Testing Protocols




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### UNVENTED SPACE HEATERS

- Remove unvented space heaters
- Secondary heat source allowed under WAP if meets ANSI Z21.11.2



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### OPPORTUNITIES DURING ENERGY UPGRADES

Test carbon monoxide / address high levels	Exclude pests / particularly during air sealing	Use lead safe work practices	Test for radon
Don't disturb asbestos or vermiculite – test?	Enhance heating and cooling systems	Install efficient filters – MERV 6	Seal garage connection
Minimize contaminants in products	Install poly on dirt crawl spaces	Cover sump pumps to reduce radon and gases	



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### ASSESSMENT QUESTIONS

- Are there gas appliances that could produce carbon monoxide?
- Are there rodents, cockroaches or other pests?
- Was the home built before 1978 and is there peeling, flaking paint?
- Should you test for radon?
- Is there vermiculite or asbestos present?
- Is there an attached garage?
- Do the occupants have health concerns?



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### YOU NEED TO PROTECT YOU: HEALTH RELATED WORK PRACTICES

- Safe spray foam use – gloves, respirator etc.
- Work lead safe



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### WAP REQUIRED ACTIVITIES

- Combustion safety testing and proper venting
- Lead Safe Work Practices and EPA RRP



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### WAP ELIGIBLE EXPENSES

- Pest removal and exclusion where infestation would prevent weatherization
- CO alarms
- Radon testing, poly on dirt floors and other radon control precautions
- Unvented space heater removal, except secondary sources compliant with ANSI



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### EPA PROTOCOLS FOR ENERGY UPGRADES

- Identify EPA minimum precautions
- Identify EPA additional actions

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