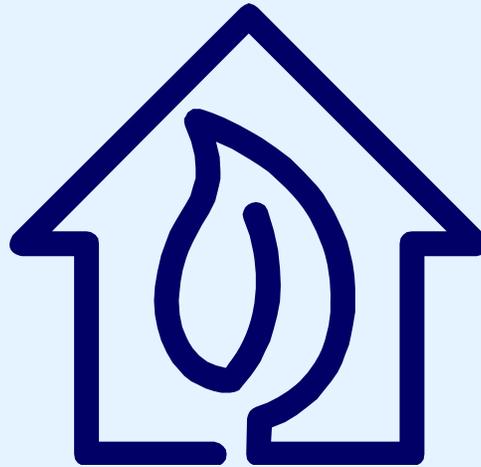


# Seven Principles of Healthy Homes



Adapted from the National Center for Healthy Housing, Healthy Homes Training Center

Where thou  
art, that is  
home.

*Emily  
Dickinson*



It may be frail; its roof may shake; the wind  
may blow through it; the storms may enter;  
the rain may enter – but the King of  
England cannot enter; all his forces dare  
not cross the threshold of the ruined  
tenement. *William Pitt*

There is no place like  
home. *Dorothy,  
Wizard of Oz*

Home is the place  
where, when you  
have to go there, they  
have to take you in.  
*Robert Frost*



Home is where  
the heart is. *Pliny*

One of our deepest  
needs is to be at  
home.

*Timothy Radcliffe*

The strength of a  
nation derives from  
the integrity of the  
home. *Confucius*

He is happiest, be it king or peasant, who  
finds peace in his home. *Johann Wolfgang  
von Goethe*

# Different Approaches

## HEALTH

Primary Prevention

Secondary Prevention

Epidemiologic Triangle

Lead

Radon

Allergens/Asthma

Combustion Products

Unintentional Injuries

Insects & Rodents

Mold & Moisture

Pesticides

Asbestos

Fire

## HOUSING

Well Constructed

Energy Efficient

Affordable

Comfortable

Well Maintained

# What is Healthy Housing?

**Healthy Housing is**

- **Designed,**
- **Constructed,**
- **Maintained, and**
- **Rehabilitated**

**in a manner that is conducive  
to good occupant health.**



# Why a Holistic Approach?



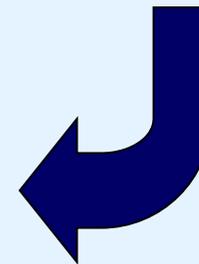
**Moisture/Water Intrusion**



**Mold**



**Asthma  
Exacerbation**





**Moisture/Water Intrusion**



**Structural Damage**



## Structural Damage



**Pests**



**Lead  
Poisoning**



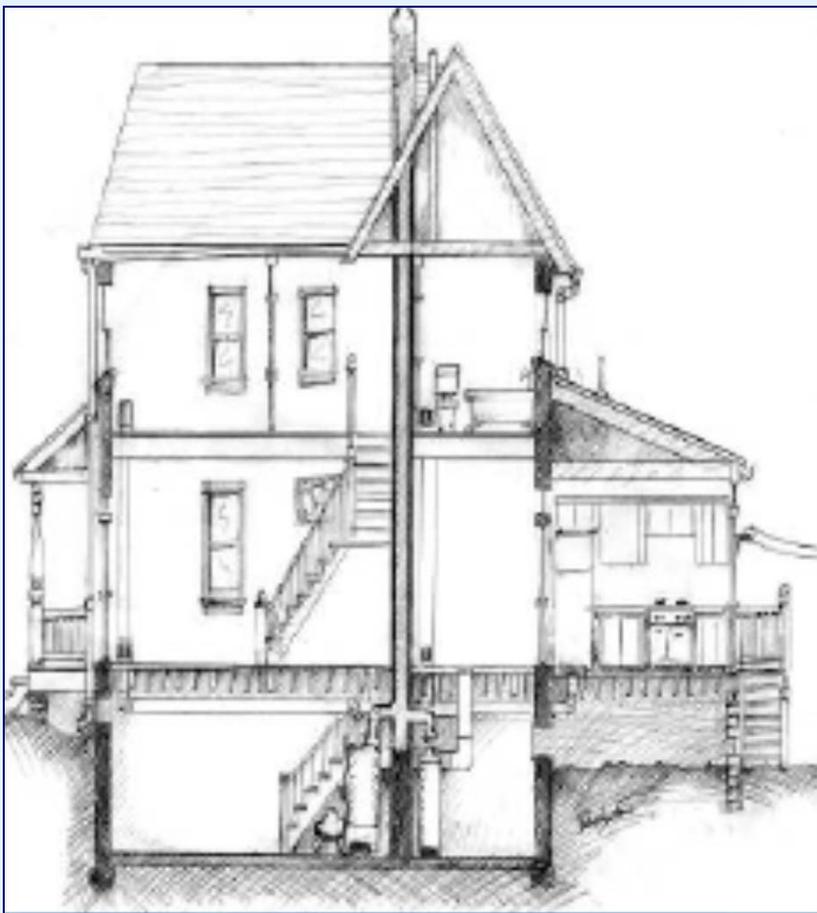
**Injuries**



**Fire**

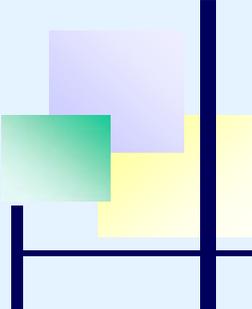


# 7 Healthy Homes Principles

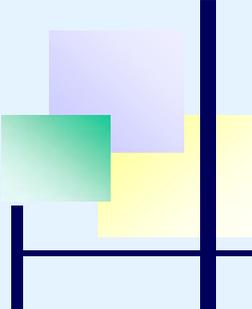


**Keep It:**

- 1. Dry**
- 2. Clean**
- 3. Ventilated**
- 4. Pest-Free**
- 5. Safe**
- 6. Contaminant-Free**
- 7. Maintained**



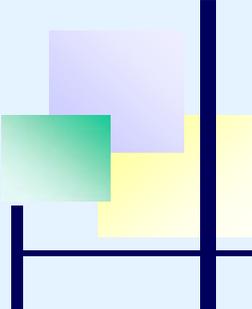
**Keep It Dry**



# Keep It Dry

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- **Poorly managed rainwater/groundwater**
  - **Poor roof, wall, window & foundation drainage**
  - **Defects in rain barriers**
- **Plumbing leaks**
- **Condensation on surface**
  - **Surfaces chilled by mechanical equipment**  
**Earth contact, outdoor air contact**
- **Construction moisture**
  - **Concrete, wet spray cellulose, gypsum mud**
  - **Damp earth in crawlspace**



# Keep It Clean

---

- **Reduced exposure to:**
  - **Chemical contaminants**
  - **Allergens**
  - **Pest droppings and urine**
  - **Pesticides and consumer chemicals**
  - **Heavy metals such as lead and arsenic**
- **Reduced harborage for pests**



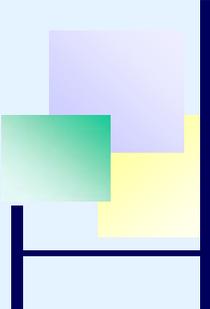
**Humid buildings may be colonized by dust mites. In dry climates dust mites are limited to porous materials that get humidified.**



# Where Does the Dust Come From?

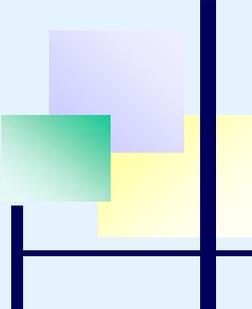
- **Brought-In**
  - Home-Grown
  - Lead Dust
  - Dust Mites
  - Resident-Made
  - Garbage
- **Clutter**



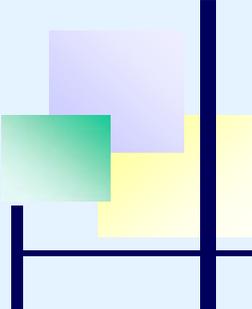


## **What can we do to buildings to make them more cleanable?**

- **Install dust walk-off systems at entryways**
- **Keep activities which create dust away from people**
- **Provide smooth, cleanable surfaces**
- **Provide effective storage space (to help avoid clutter)**
- **Choose flooring that is easy to clean**
- **Use vacuums that have good filtration and can be emptied quickly and thoroughly**



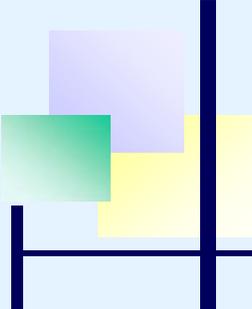
**Keep It Ventilated**



# Keep It Ventilated

---

- **Pollutants can be found in concentrations 2-5 times higher indoors than outdoors**
  - **Volatile organic compounds**
  - **Radon**
  - **Moisture**
  - **Environmental tobacco smoke**
  - **Particulate matter**
  - **Allergens**
  - **Mold**
  - **Carbon monoxide**



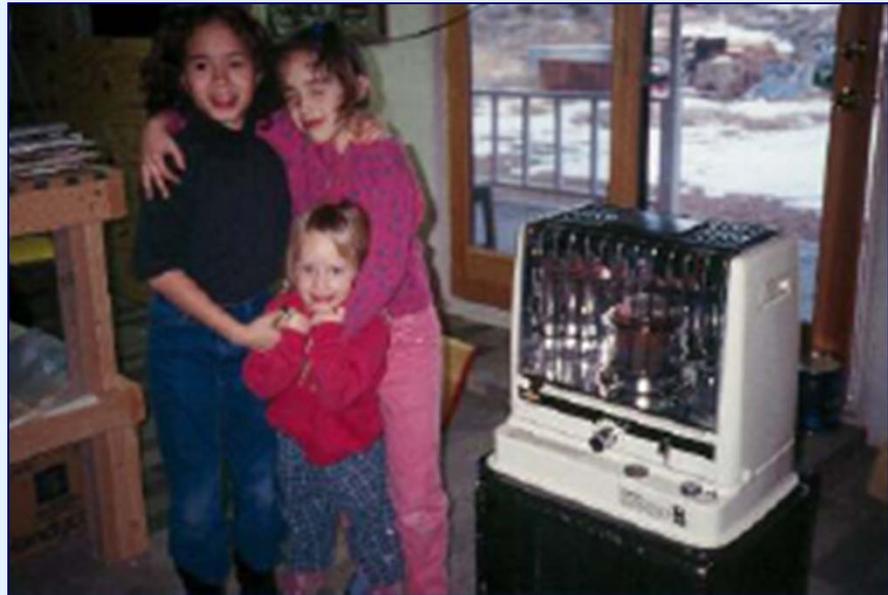
# Combustion Contaminants?

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- **Carbon Monoxide**
  - Fatigue, headaches, dizziness, confusion
  - The “Silent Killer”
- **Nitrogen Dioxide**
  - Eye, nose, and throat irritation
  - Shortness of breath
- **Moisture**
  - Damp Indoor Environments

# Source of Combustion Contaminants

- **Oven as heater**
- **Spillage from furnace, water heater, fireplace**
- **Ventless heater or fireplace**
- **Car exhaust from attached garage**



# Carbon Monoxide

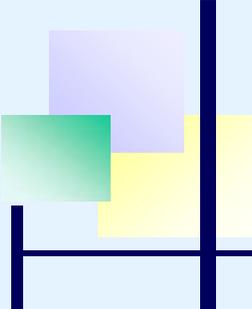
**Approximately 300 deaths plus more than 100,000 medical visits occur per year.**



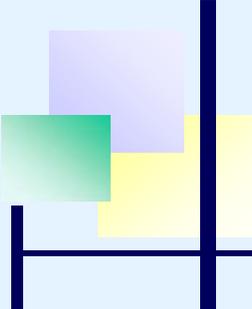
# Carbon Monoxide Alarms

- **Protects Against Life Threatening Conditions**
- **Placement:**
  - Place near sleeping area
  - Put on every level of a home to provide extra protection
  - Do not install directly above or beside fuel-burning appliances





**Keep It Pest-Free**



# Keep It Pest-Free

---

- **Integrated Pest Management**
  - **10 elements per HUD Guidance**
  - **Housekeeping**
  - **Maintenance**
  - **Exclusion**
  - **Ongoing Monitoring**
  - **Pesticides when needed**

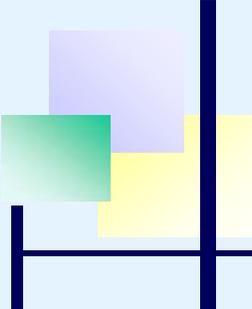
# Why Pesticide Free?

**Health effects associated with pesticides include:**

- eye, nose, throat irritation
- Skin rashes, stomach cramps, nausea
- Central nervous system damage
- Kidney damage
- Increased risk of cancers



**Use of some pesticides associated with increased risk of childhood leukemia.**



# Integrated Pest Management

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- **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**
- **Knock down population**
  - **Traps**
  - **Appropriate pesticides**

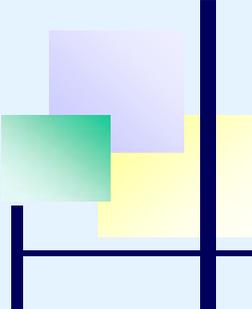
# Illegal and Risky Pesticides

- Pesticides that look like candy
- Insecticide chalk (aka Miraculous or Chinese chalk)
- “Tres Pasitos”



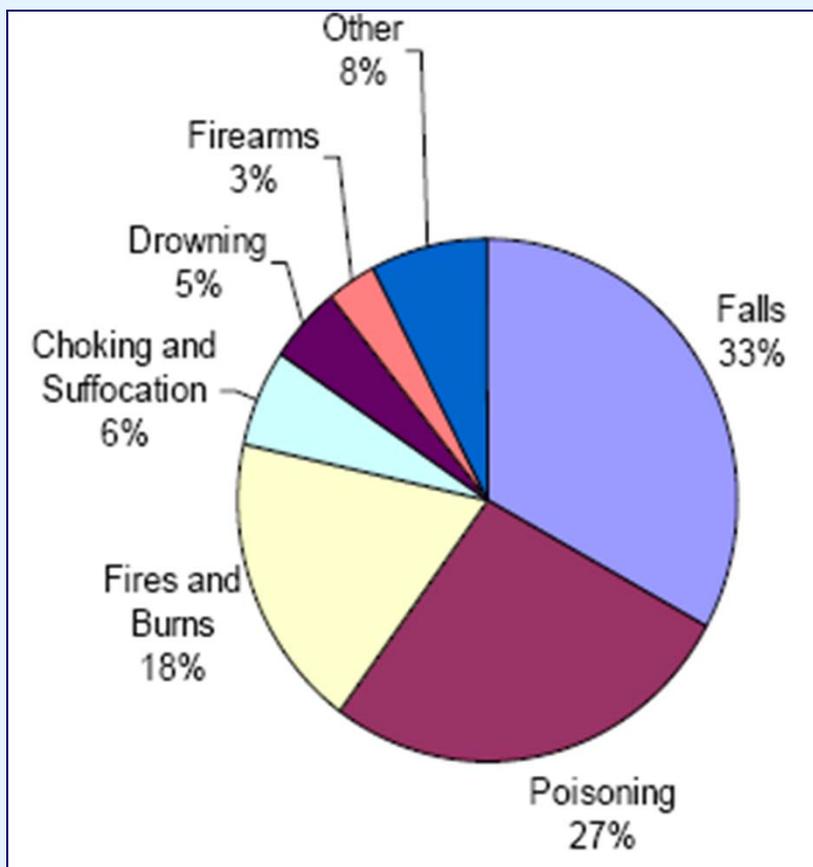
↑  
**Candy**





**Keep It Safe**

# Keep It Safe



**What are the most common causes of home injury deaths?**

# Which Age Groups Are Most Susceptible?

Falls are leading cause of nonfatal home injury for children from birth through 14 and for older population.

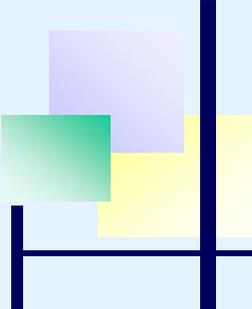


Adults 80+ years of age are at 20 times higher risk for death from injury than younger individuals.

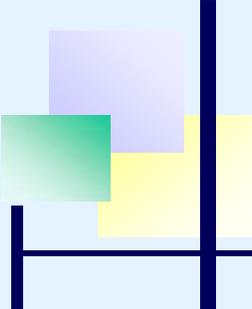
The highest rate of injury death for infants is from choking and suffocation.



Highest rate of injury death for 1-14 year olds is fires and burns.



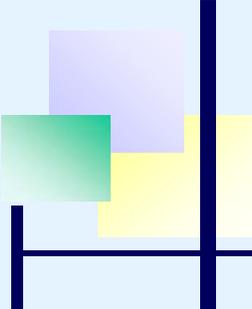
**Keep It  
Contaminant-Free**



# Keep It Contaminant-Free

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- **Lead and Lead-Based Paint**
- **Environmental Tobacco Smoke**
- **Radon**
- **Biologicals (see Keep It Dry)**
- **Combustion By-Products (see Keep It Ventilated)**
- **Pesticides (see keep It Pest-Free)**
- **Asbestos**
- **Volatile Organic Compounds (VOCs)**
- **Sewer Gas**



# Why Avoid Lead?

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## Related Health Effects

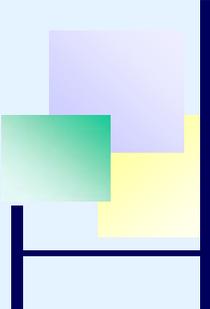
- **Reduced IQ**
- **Learning disabilities**
- **Impaired hearing**
- **Reduced attention spans, behavior problems**
- **Anemia**
- **Kidney damage**
- **Damage to central nervous system**
- **Coma, convulsions, death**

# Asbestos: Health Effects

- Lung Cancer
- Mesothelioma
- Asbestosis

**Smokers are at greater risk!**





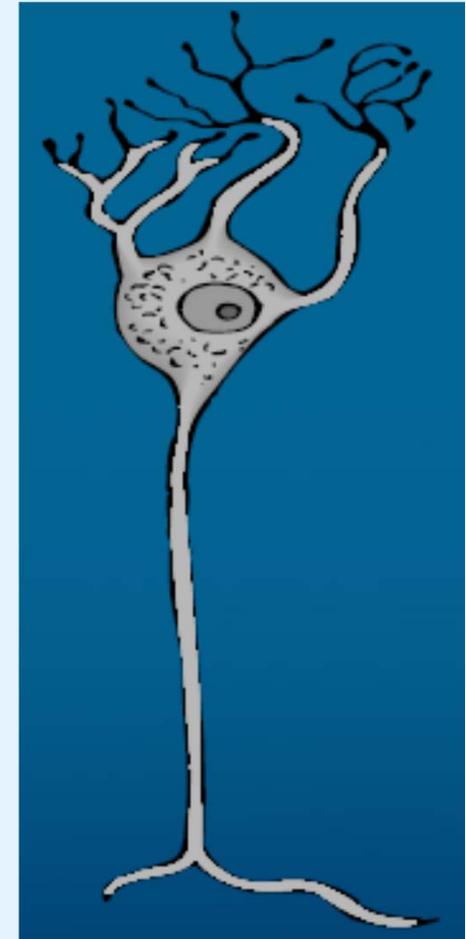
# What Can You Do About Tobacco Smoke in Homes and Cars?

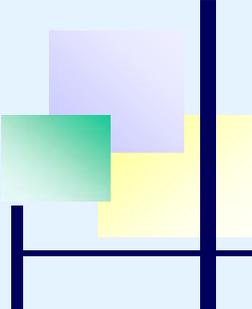
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- **Quit, if you're ready there's help**
- **Don't smoke around children**
- **Smoke outside**
- **Exhaust vent the places where people smoke**

# Why Avoid VOCs?

- **Potential Health Effects:**
- **Eye, nose, throat irritation**
- **Headache, nausea, loss of coordination**
- **Liver, kidney, and brain damage**
- **Cancer**
- **Child developmental problems**



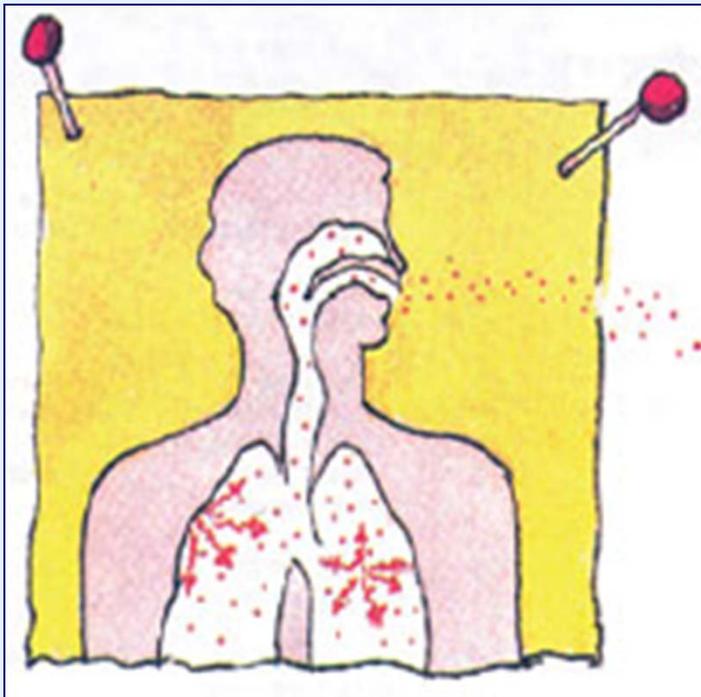


# VOC Solutions

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- **Control the source**
  - **Avoid using products that contain VOCs**
  - **Use lower VOC options (i.e. paints)**
  - **Keep containers sealed**
  - **Store away from air draw sources**
  - **Remove unwanted products from home**
- **Ventilate**
  - **Open doors and windows**
- **Don't use what you don't have to**

# Radon

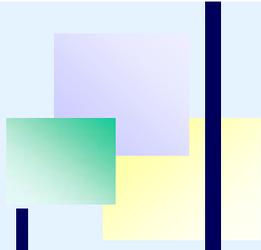


- **2<sup>nd</sup> leading cause of lung cancer with more than 20,000 deaths annually (smoking is #1)**
- **Leading cause of lung cancer in nonsmokers and people who have never smoked**

# Sewer Gas

- **A mixture of gases generated by bacteria and fungi While digesting wastes**
- **Sources: dried out traps in sinks and toilets, public sewers, septic systems, swamps, and ponds**
- **Often contains methane, hydrogen sulfide, ammonia, carbon dioxide and carbon monoxide**
- **Causes asphyxiation, leading to unconsciousness, brain damage, and death**





**Keep It Maintained**

# Keep It Maintained

- Inspect
- Clean
- Lubricate
- Replace
- Repair
- Organize

 **National Center for Healthy Housing**  
A national healthy homes training center and network

### Healthy Homes Maintenance Checklist

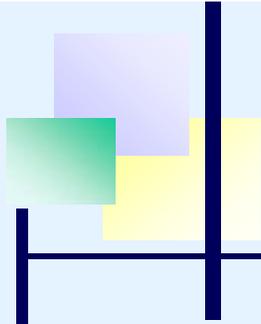
The following checklist was developed for the Healthy Homes Training Center and Network as a tool for healthy home maintenance. A healthy home is one that is constructed, maintained, and rehabilitated in a manner that is consistent to good occupant health.

To maintain a healthy home, occupants should keep it dry, clean, and pest-free, and pay attention to and control environmental conditions both indoors and outdoors. Good home maintenance can act to reduce allergies, prevent illness, and reduce injury from accidents. This checklist provides basic guidelines; there may need to be checkouts more often depending on local conditions and manufacturer suggestions.

Developed by the National Healthy Homes Training Center for the National Center for Healthy Housing and the U.S. Environmental Protection Agency.

	dry	clean	pest-free	well-maintained	well-ventilated
<b>Yards &amp; Exterior</b>					
Water drains away from house	✓				
No trip, fall, slipping, or other safety hazards	✓	✓			
Fences around pool/pond	✓	✓			
Check for signs of rodents, bats, raccoons, snakes	✓	✓			
Clean outdoor faucets and hoses		✓			
Clean exterior walls and check drainage	✓	✓			
Clean gutters and downspouts	✓	✓			
<b>Basement &amp; Crawlspace</b>					
No wet surfaces, puddles	✓	✓			
Seal pipe and check water seeping	✓	✓			
Floor clean and dry	✓				
Vacuum basement regularly	✓				
Check for signs of rodents, bats, raccoons, snakes		✓			
<b>Exterior Roof, Siding, Windows - check for leaks</b>					
Shingles in good condition	✓				
Check chimneys, vents, flues for proper, safe, tight fit	✓				
Make sure gutters discharge water away from building	✓				
Check attic vents		✓			
Check attic for signs of rodent infestation	✓				
Check for scales and corrosion			✓		
Look for peeling paint, efflorescence	✓				
Look for signs of leaks where debris collects in house	✓				
Check before window & door that flashing is intact	✓				
Repair rot, cracked glass		✓			
Look for signs of leaks at windows and door sills	✓				
Clean dryer vent	✓	✓			
Check exhaust ducts are clear	✓	✓			

Continued on the next page



**Thank You**