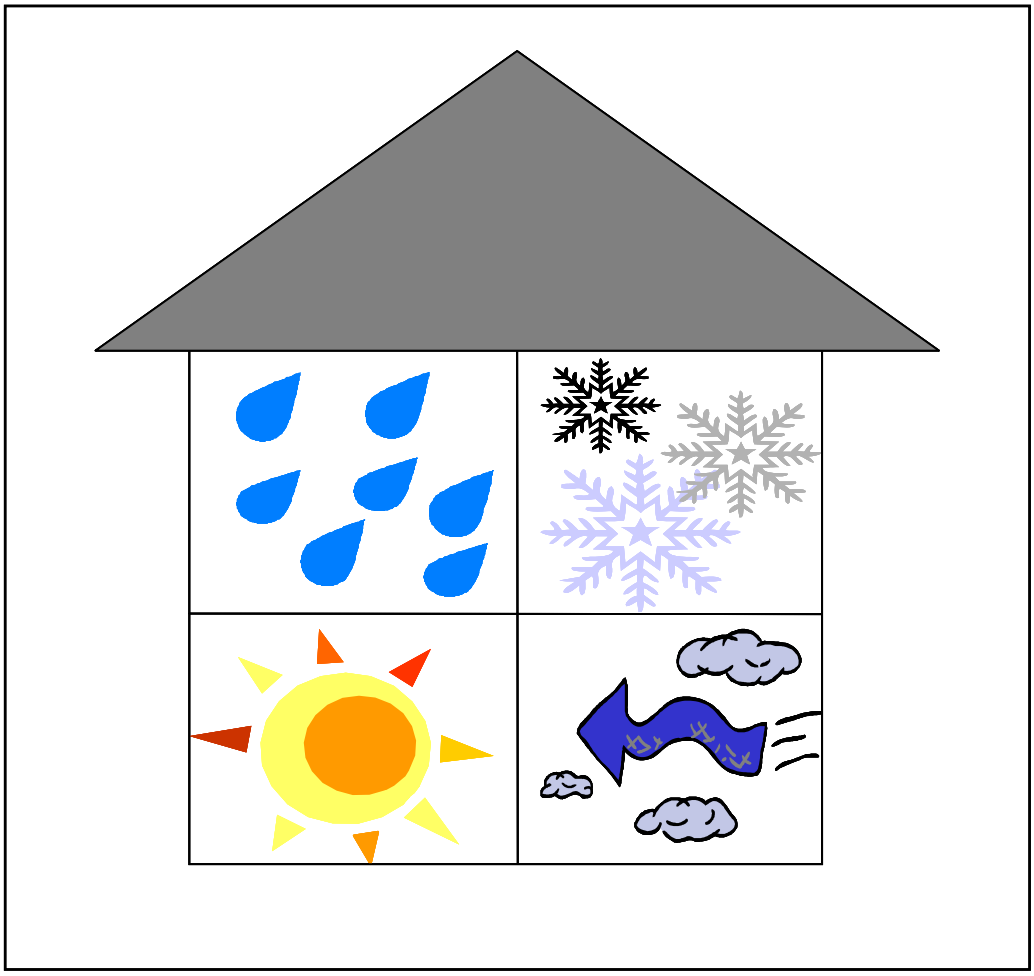
How your house works!®



An EZ guide & workbook to Home Health principles

opportunity council

Healthy Homes®

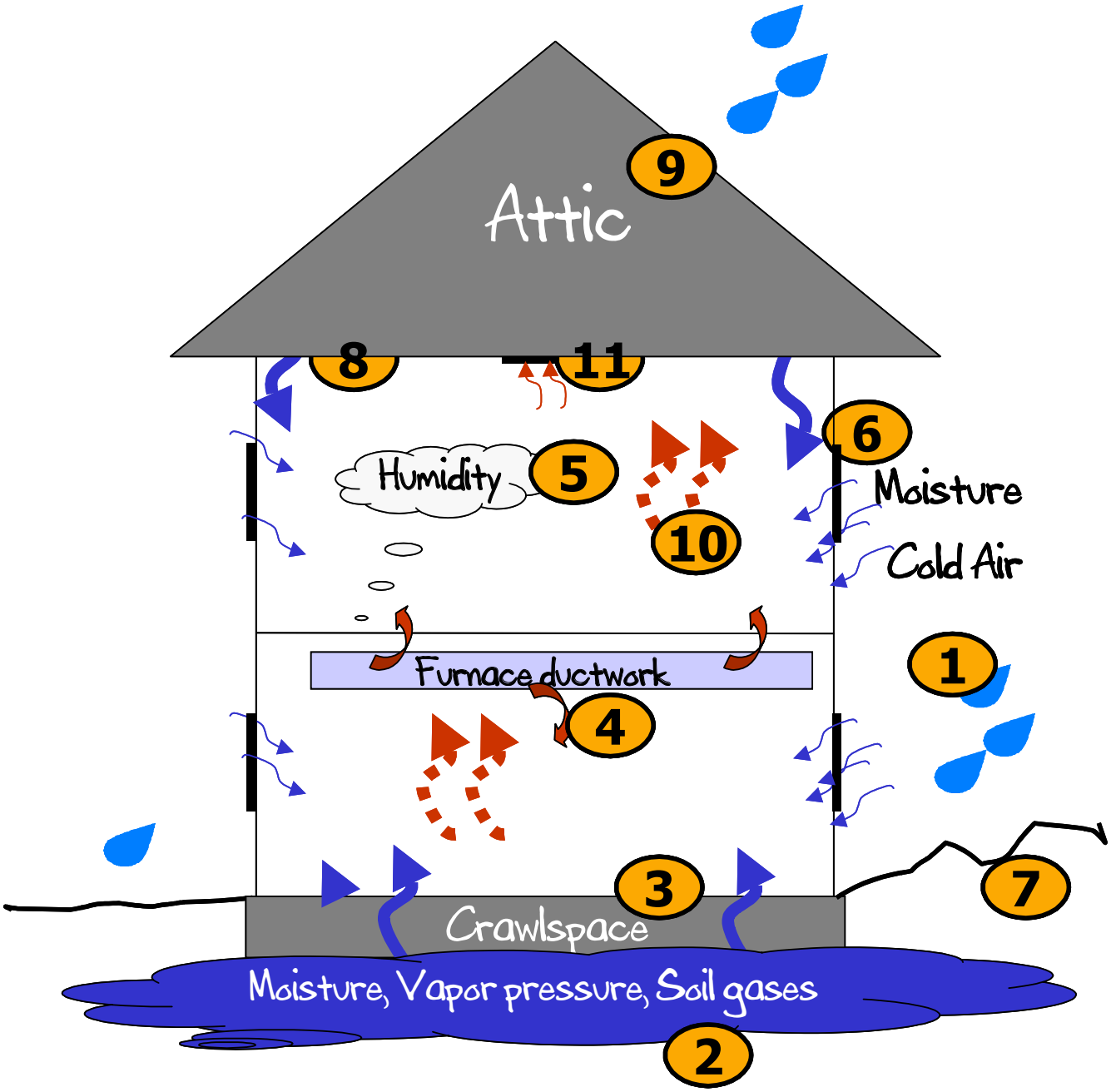
-

What's Inside '

This booklet highlights many important aspects of your home that relate to health.

We hope that by understanding your home better, you will recognize the conditions that are within your power to control, leading to a healthier, happier place to live!

The Basic Elements important to Home Health $



The Basic Elements of Home Health – $ the details & solutions $

1. The weather in colder climates, particularly rain, provides moisture access on and around our homes. S Preventing moisture intrusion is top priority.

2. The moisture provided by rain & snow seeps into the ground. This moisture is then converted to vapor, creating a humidity increase in the ground. Other gases, known as soil gases, can also rise from the ground into our homes. Water close to the home causes structural damage. S Check gutters, create slope away from home, put in curtain drains.

3. The crawlspace may contain water, mold & pests. Unless specific measures are taken to isolate the crawlspace from the rest of your home, you are breathing air from your crawlspace. S Apply a 6 mil poly barrier to ground in crawl space. Air seal all penetrations to crawlspace.

4. Ductwork distributes the heat in your home, but also creates pressures that push and pull air from potentially undesirable places in your home. S All ductwork should be air sealed.

5. Indoor humidity may be created by showers, cooking, cleaning, and vapor pressures from the crawlspace and ground. S Humidity must be controlled.

6. Windows can leak (either cold air or water), or be of a low R-value, meaning they do not resist cold temperatures very well. This can lead to condensation and mold growth around your windows. S Windows should be updated to current energy efficiency standards, and be caulked and sealed in place.

7. The land around your home may be sloped or flat. It is best to have the ground slope away from your home at all times to allow water to move away from your home. Homes on slopes may encounter: springs or high amounts of surface water. S This water must be allowed to move around your home, not into it. Curtain drains, drain pipe.

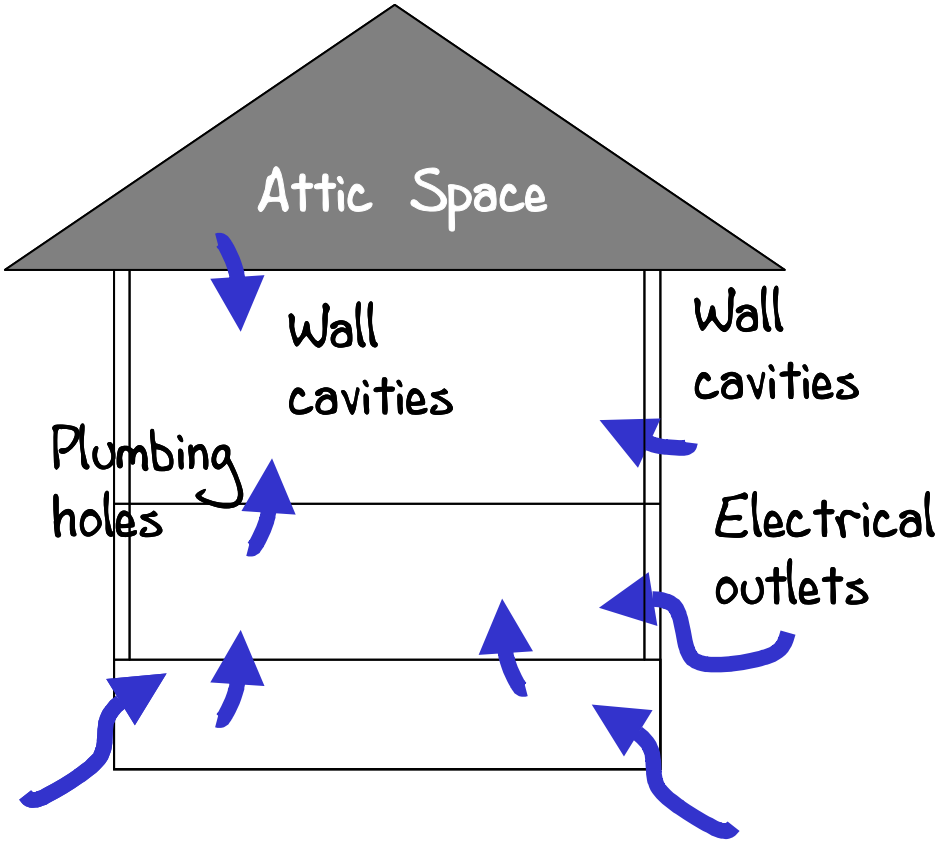
8. Attics can leak air from the pressures of wind, heat or ductwork. S They should be air sealed to make sure insulation & other contaminants do not get in the living space. Attic access doors, light fixtures and furnace return grilles should be checked.

9. The roof is the most important structure of your home. It should not leak. Unattended roof leaks create exponential damage i.e. leaky roofs = leaky inside walls, ceilings etc.. S Maintain your roof, replace when necessary, plan your replacement, DO NOT WAIT!

10. Heat rises in the home. This is caused in part by Stack Effect. Stack Effect can push and pull air through your home, creating pressures. S Air sealing the attic can lessen the amount of heated air that leaves your home & limit flow of contaminants.

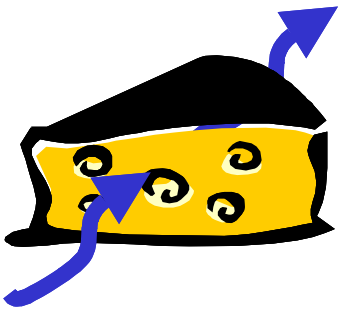
11. Exhaust fans ventilate bathrooms, ranges or your whole house. Make up air sources must be provided mechanically, through inlets or through opened windows. S Exhaust fans are necessary in the NW, run at least 45 min after the shower.

Houses are holey…kinda like Swiss cheese &

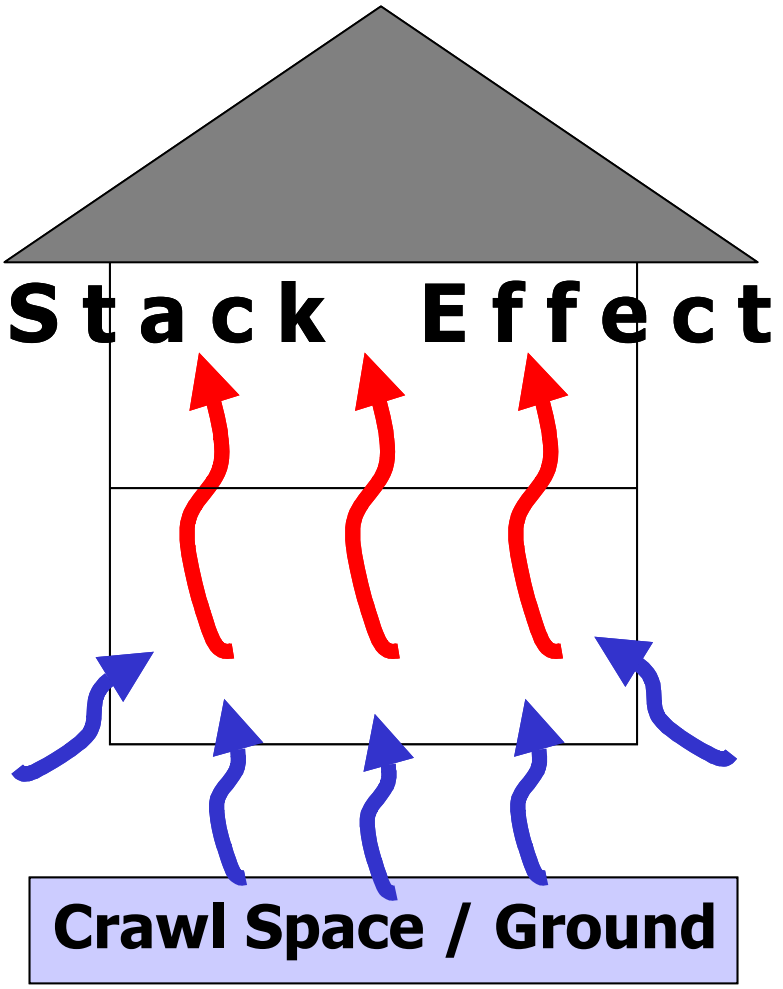


Air moves through holes, cracks and other penetrations within your home. The forces of wind, mechanical ventilation, & stack effect pull and push air around.

That means air from your crawlspace can move into your home for example. (

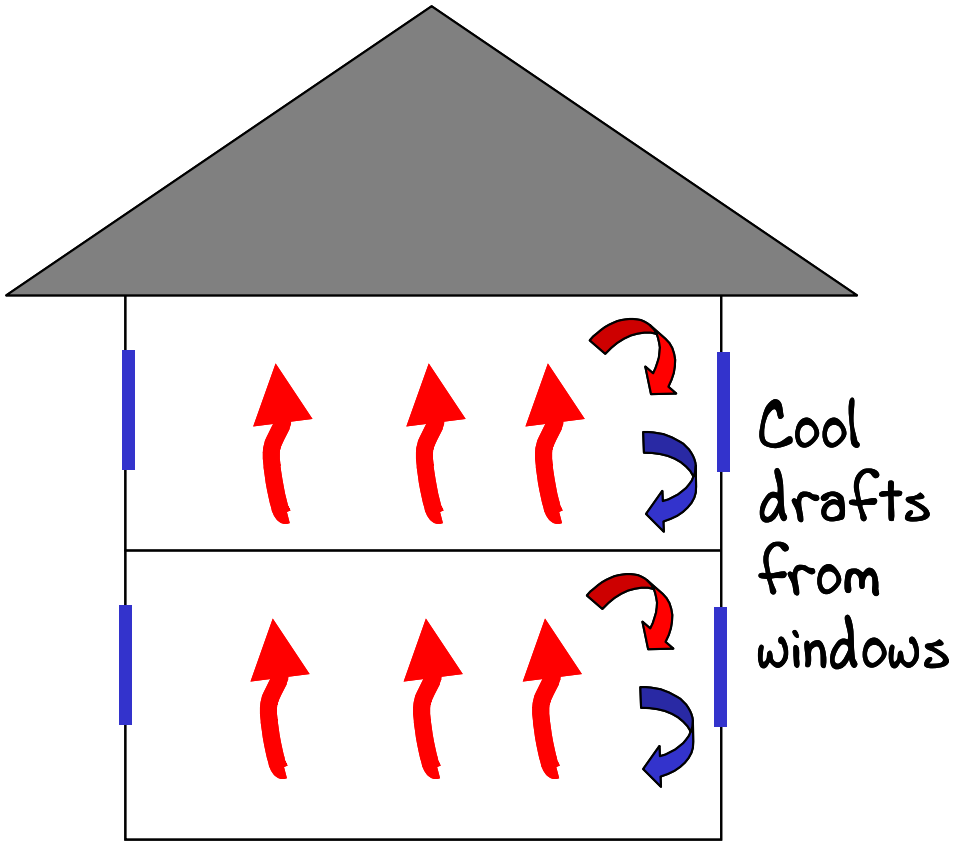


Warm air rises %



Temperature and Convection)

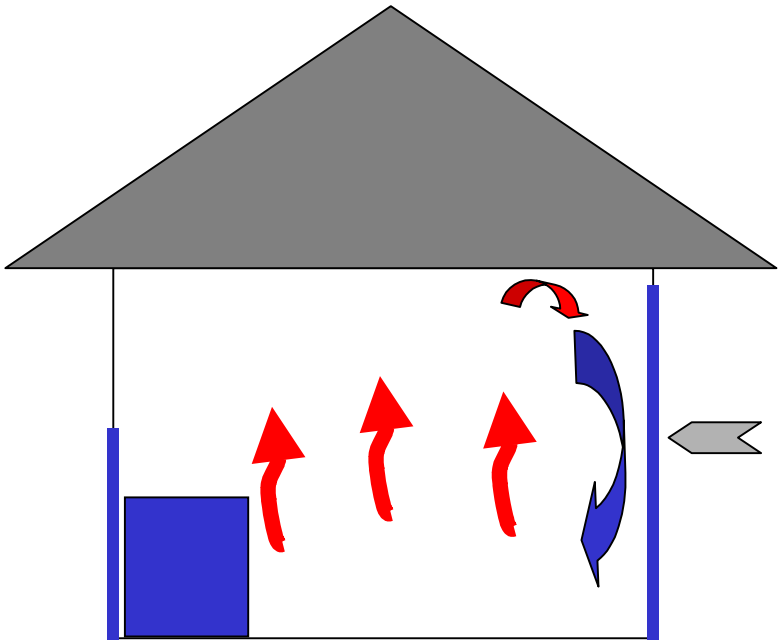
Temperature differences cause convection & air flow movement



Temperature throughout the home)

What happens in cool/un-ventilated areas of the house?

General rules: Keep areas against outside walls clear, Be sure each room as adequate heat, ventilation & air flow. '



Outside walls/ windows tend to be cooler, creating a surface cool enough to condense moisture from the air like a glass of ice water. This happens especially if the room itself is always cool or higher in humidity or both.

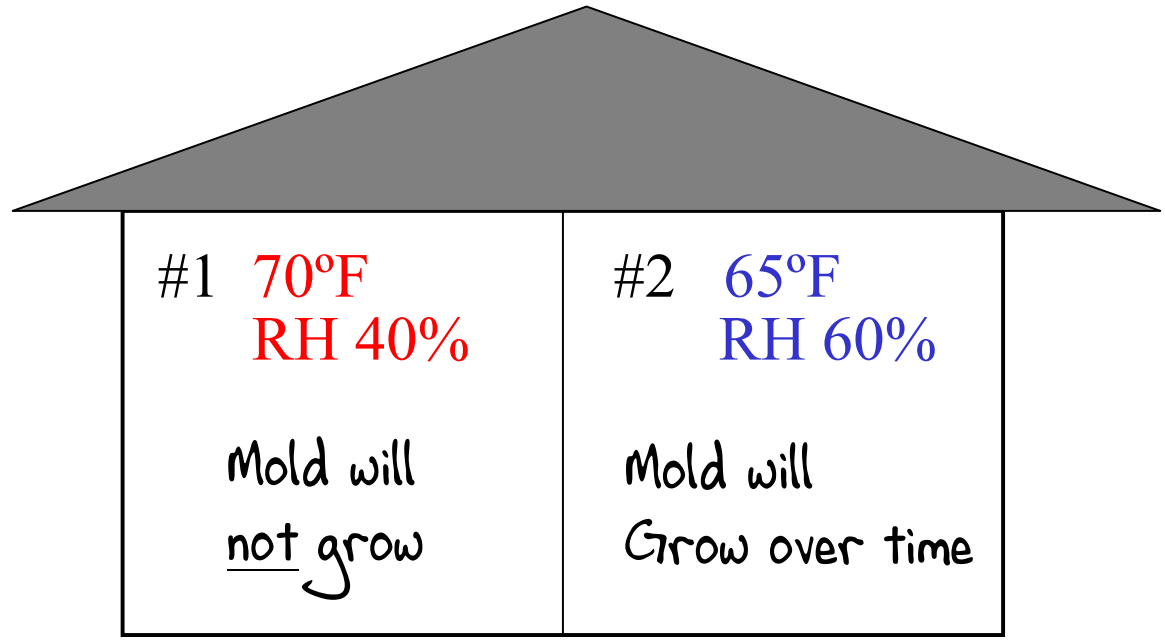
Furniture placed tight against outside walls does not allow air flow, creates a cool, high relative humidity area for moisture to condense, often resulting in mold growth. Leaving an air space of even an inch can help!

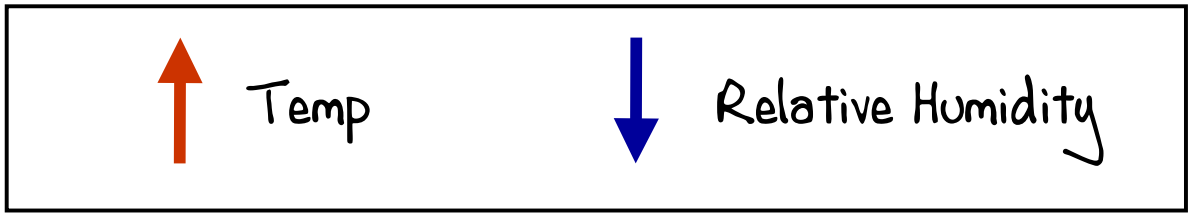
Temperature & Humidity

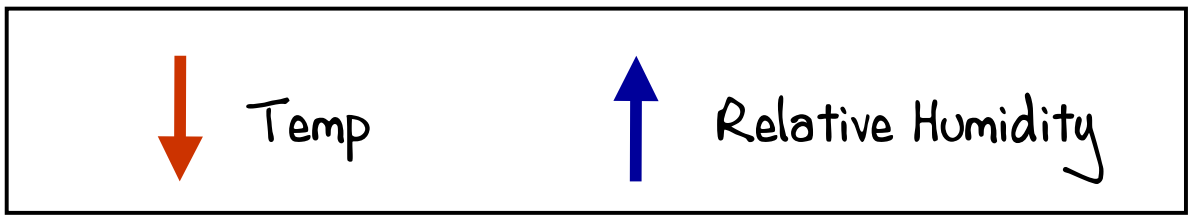
Warmer air holds more moisture

Example: Say we have air with a certain amount of moisture.

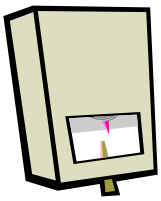
Now put that air in a 70º room and a 65º room. Look how the Relative Humidity changes.







Humidity



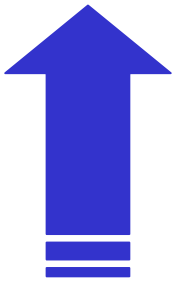
Too high - 50% RH and above

Just right – 40-50%

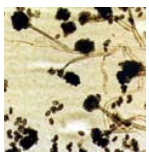
How do you know?

Check your humidity gauge. (hygrometer)

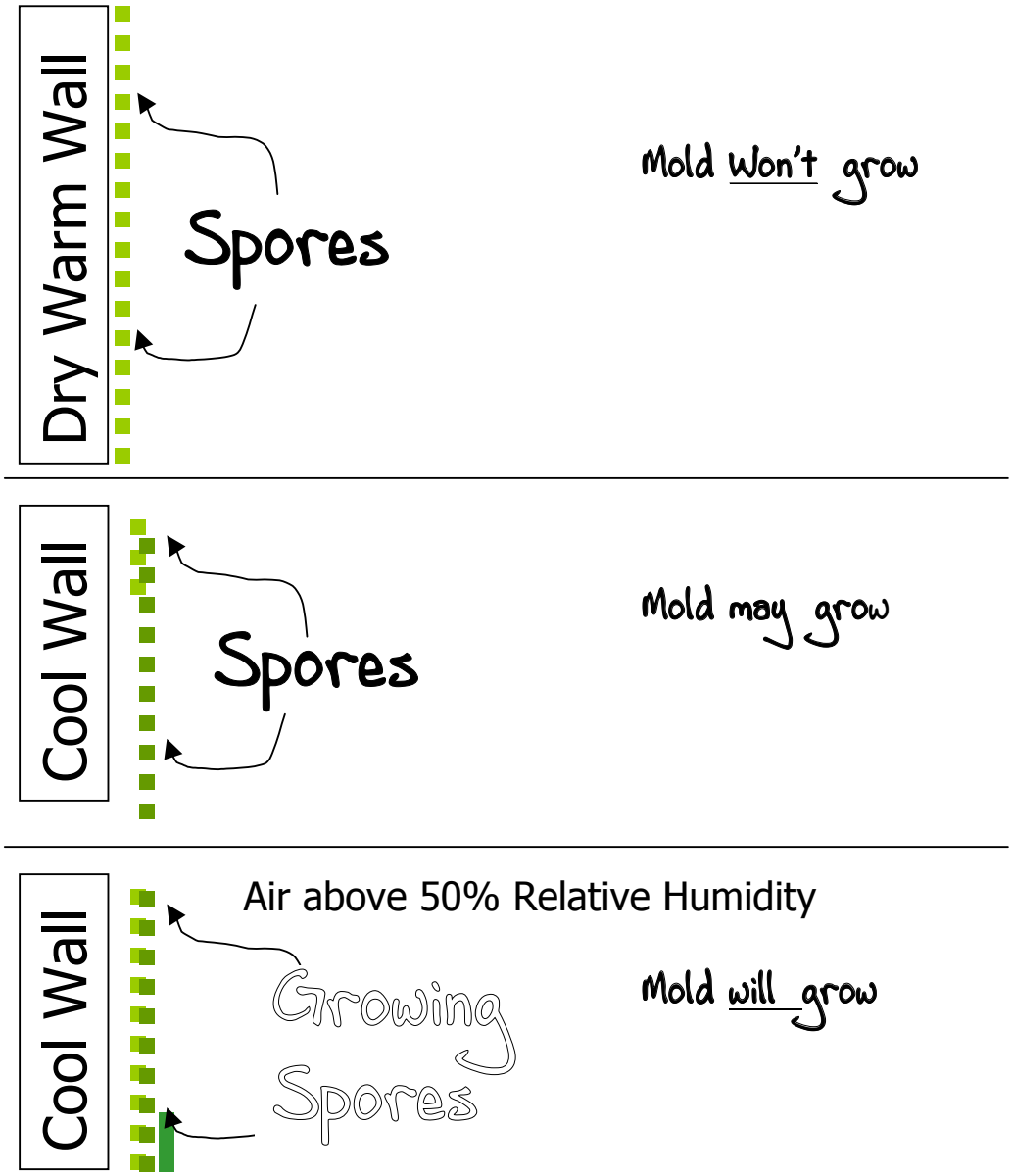
When Relative humidity is too high



Molds
Dust mites
Bacteria & Virus
Materials in/of home begin to break down

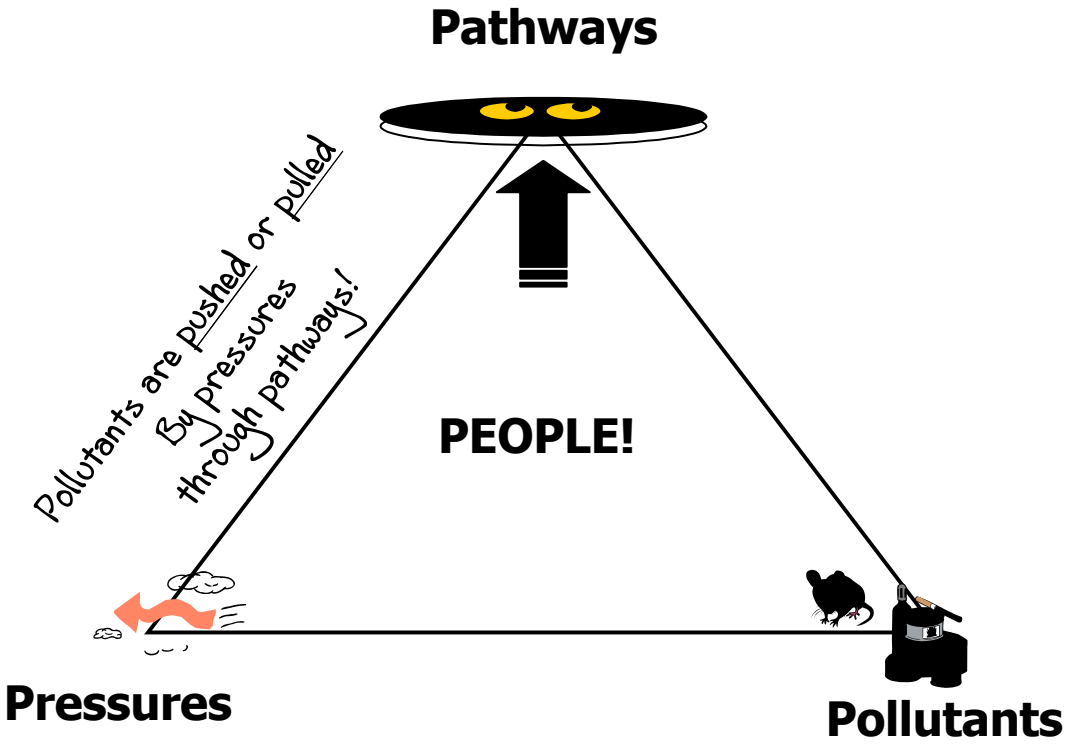


Mold Spores are everywhere… that's OK %



It's the conditions that count !

Pressures move Pollutants through Pathways

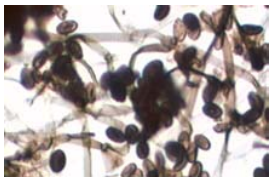


People can be in direct contact with pollutants.

People can be indirectly in contact with pollutants via pathways.

Pollutants (what are the sources)

Molds/Mildews



Toxic chemicals

Rodents

Smoke

CO

Pathways (where is air getting through)

Holes

Cracks

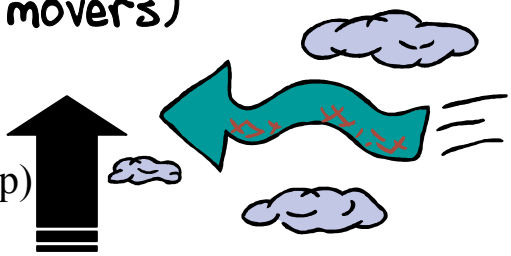
Crevices

Plumbing/Electrical Penetrations

Pressures (what are the movers)

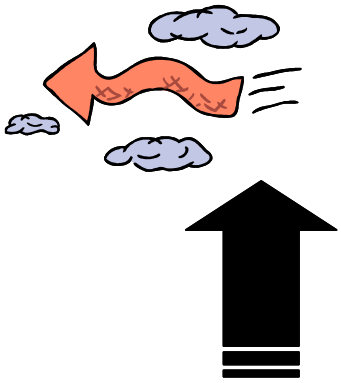
Home Temperature

Air Movement (fans, heater,temp)



Weather Outside (wind, temp)

Worksheet – Pressures & Pathways)



Pressures)

Home Humidity %
(Identify RH in each room)

_____

_____

_____

Pathways in your home)

_____

_____

_____

Plumbing/Electrical Penetrations %

Pollutants in your home)

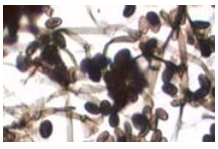
_____

_____

_____

_____

_____



Where do you spend your time?

1.Name all the rooms in your house '
2.How they are used '
3.How often they are used '
4. Doors routinely open or closed? Why?

Room:_____
How is it used:_____
How often (put hours)_____
Doors routinely open or closed? Why?_____

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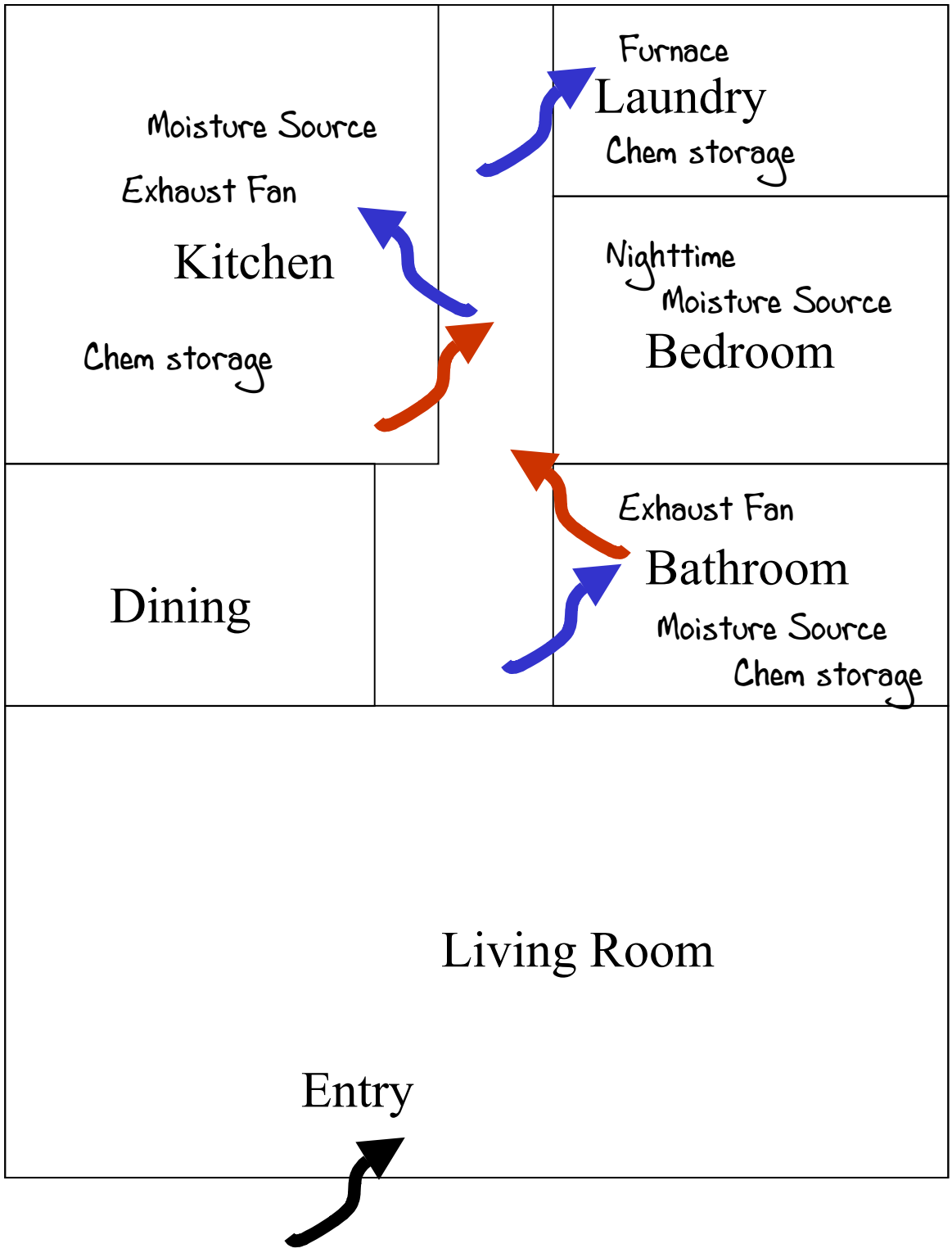
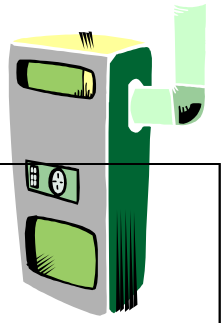
Worksheet – Floor Plan - Example *



Worksheet – Floor Plan (draw your own!) &

Heating System Types



Forced Air – has built in circulation

Electric or Gas

- Moves air
- Can filter air
- Heats air
- Can include fresh air ventilation
- Must have filter (HEPA)
- Filter must be changed
- Vents must be cleared
- Duct work

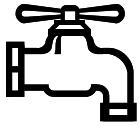
Radiant – relies on convection & conduction (

- Wood stove (
- In floor (
- Baseboard (
- Hot Water/Steam wall units (

- Heats materials
- Can be more quiet
- No ducts
- Can create cold spots if only one source i.e. woodstoves & baseboard heaters
- Requires ventilation/circulation

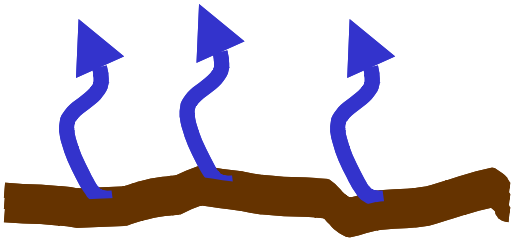
#1 Problem of homes & Occupants.....

Unattended Leaks



Soil gases & Moisture from the ground

(under the house)

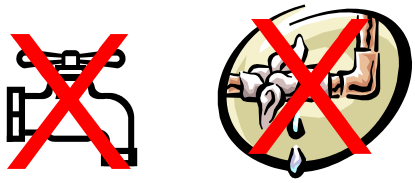


MOISTURE!!!!

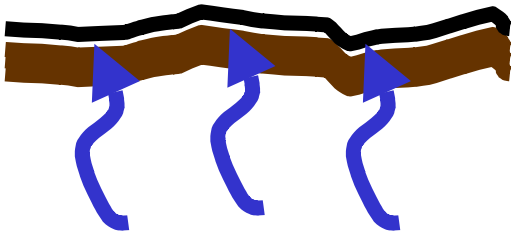
Humidity from people, showers & cooking

How to control moisture $

Fix Leaks Promptly

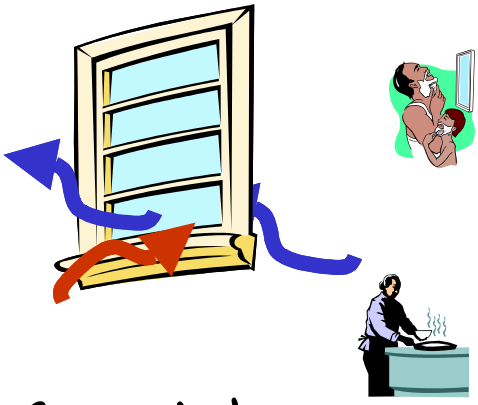


Install vapor barrier/ ventilate



MOISTURE!!!! $

Bath fan on during and after shower for 45 minutes!



Open Windows

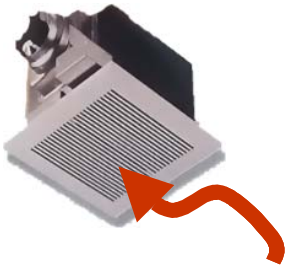
VENTILATE!!!

Properly ventilate through Spot fans & whole house ventilation fans, and open windows

Ventilation....the moisture mover! ,

Always run the bath fan during shower '

Run for at least 45 minutes



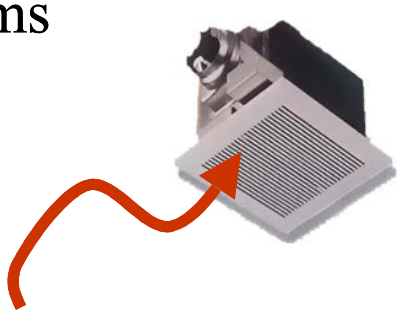
Use range fan while cooking

Install fresh air make up when necessary (air ports when necessary)

Why?

Spot ventilation such as bathroom fans remove moisture at the source

Moist air created from showers, baths, cooking and dryers venting into the home create high humidity leading to mold and dust mite problems



#1 Killer of Occupants…..

You can't see it…..

Sometimes you can't smell it $
(unless the gas is scented)….. $

CO

Carbon Monoxide!!!!

Sources

Poorly vented combustion appliances $

Gas leaks to those appliances $

Fires that die out and smolder without adequate $
ventilation. $

Gas water heaters, furnaces, ranges, dryers, $
wall heaters back-drafting and spilling $

Starting cars in attached garages, letting them warm up $

What you can do about CO %

Install a CO detector

Have all combustion appliances tested by qualified technicians for back drafting and spillage, worst case tests

Have all gas appliances installed by a professional

Have your appliances regularly serviced by a professional

Be aware of the signs of CO poisoning which include:

- **Headaches %**
- **Drowsiness %**
- **Flu like symptoms %**
- **Memory loss %**

(Whole families may get these symptoms at once!)

When starting car in attached garage, be sure to have doors to home closed. Air seal those doors. Open garage door first, before starting car. Be sure to leave garage door Open for sometime after you leave when possible.

Contaminants in the home…)

- ☐ Environmental Tobacco Smoke
- ☐ Mold
- ☐ Dust mites
- ☐ Laundry Detergent
- ☐ Fabric Softener
- ☐ Cleaning Agents
- ☐ Paints
- ☐ Insecticides
- ☐ Pets
- ☐ New carpet/furniture
- ☐ Lead (if home built before 1978)
- ☐ CO (if you have combustion appliances)

Check off what you have…
Write down on the following page
Specifically each one and its location

Contaminants in the home… where)

Environmental Tobacco Smoke -

Mold -

Dust mites -

Laundry Detergent -

Fabric Softener -

Cleaning Agents -

Paints -

Insecticides -

Pets -

New carpet/furniture –

Lead – (peeling paint)

CO (if you have combustion appliances) -

Take control of the contaminants in your home

1. (Don't smoke.

2. (Don't bring toxic items into your home.

3. (Keep relative humidity levels in your home within 40-50%

4. (Clean often with non-toxic cleaners (less dust = better health)

5. (Get furniture that is free of formaldehydes. Be sure to ventilate your home at a much higher rate during & after installation.

6. (Use low VOC paints, provide adequate ventilation and drying heat to expedite off-gassing.

7. (Where possible replace carpet with hard surface flooring.

8. (Be sure your combustion appliances have regular (maintenance by a qualified technician. (

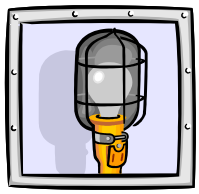
9. (Make sure all painted surfaces are kept in good condition.

10. (Install a CO detector if you have a combustion (appliances, woodstove, or fireplace. (

Top 10 Preventive Maintenance list

Where	What to look for	How often
1. Roof & Gutters	Leaks Condensation on surface in attic Missing shingles Disconnected downspouts, disconnect from roof, drainage toward foundation, splatter against house	During Rainy season After wind storms
2. Plumbing	Faucet leaks, pipe leaks, sink leaks, under sinks	Monthly, be aware with use
3. Combustion appliances	Regular Maintenance Install CO detector	Be aware of alarm
4. Appliances	Leaks from piped appliances, washing machine, dishwasher, refrigerator(if water dispense)	Monthly,be aware with use
5. Humidity	Levels above 50% Relative Humidity in home	Daily, read gauge, get sense of level of humidity in home.
6. Pests	Feces, frass, chewed materials, check corners, noises	Always ; when cleaning
7. Crawlspace	Moisture, pooling of water, dripping sounds, smells, droppings, change of smells. Take a peek with flashlight through access door.	Monthly during winter
8. Windows	Check for leaks, drafts, mold, condensation	Be aware, mostly in winter
9. Exterior walls	Check inside wall surfaces baseboards, corners, especially if stuff is crammed next to wall	Monthly during winter
10. Home	Changes in noises, smells and temperatures	Be aware, mostly in winter.

Importance of maintenance +



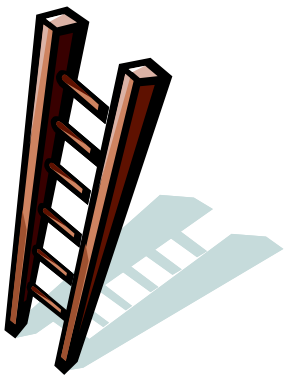
Big problems usually grow from small problems

+ Maintenance catches things before they get too big
+ Smaller problems are solved more easily than big ones…
+ And are less expensive

Consistent maintenance = Healthy Home

Maintenance, the Occupant & Health +

As a home owner or occupant, the space you live in $ affects your health.



By being proactive and caring for your home through maintenance you are caring for your health & your families health!

Effects of Preventive Maintenance '

1.) Overall health improvement, especially asthma, respiratory ailments.
2.) Your home is less expensive to take care of.)
3.) Problems that do arise are usually smaller when you find them.
4.) Usually avert big damages.
5.) You are in more control of your environment.)
6.) Your home is a nicer place to live!

Pulling it all together

There are many things you can do to create a Healthy Home. This booklet outlines most of the concepts you need to understand your home.

By understanding how your home works and following the ideas listed in this book you are taking charge of your own health!

