



# Radon: A short Presentation

UAF Cooperative Extension

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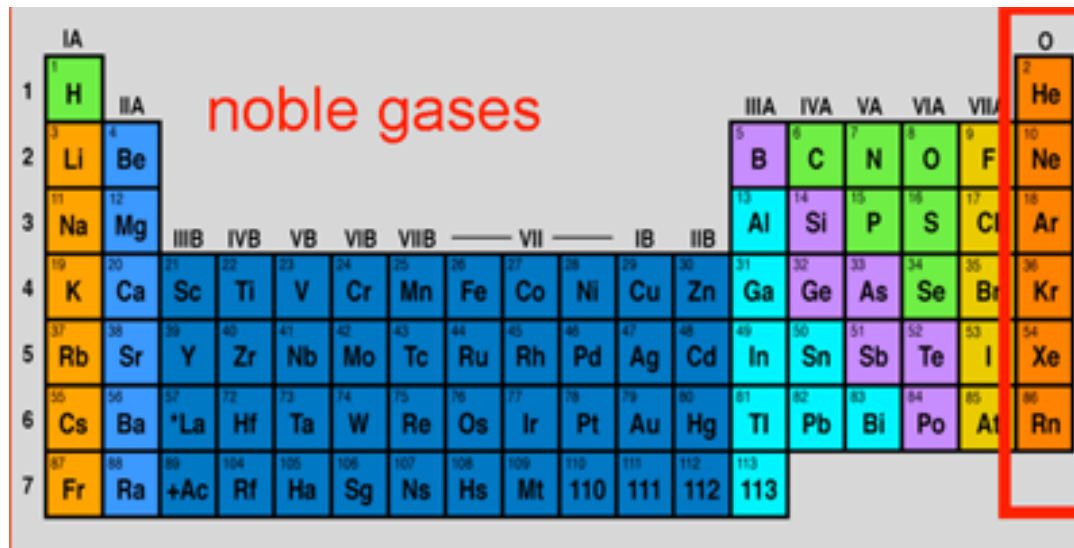


# What is Radon

- Colorless, odorless, radioactive gas
- Produced by the radioactive decay of uranium, which is found in some bedrock
- Radon escapes upward through the soil and can become concentrated in homes
- Radon causes lung cancer

# Rn

- Radon is an element. It is also a noble gas, so it is found near xenon and neon on the periodic table.



A periodic table of elements with the noble gas column (Group 18) highlighted in red. The noble gases are Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe), and Radon (Rn). The text "noble gases" is written in red above the table.

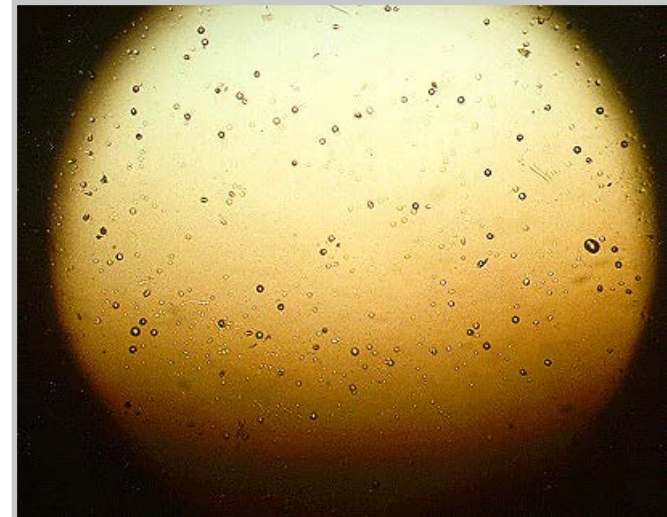
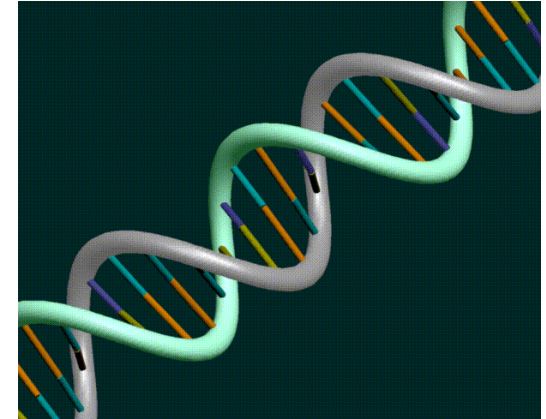
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
IA		IIA		IIIB	IVB	VB	VIB	VII B	VIII	IB	IIB	IIIA	IVA	VA	VIA	VIIA	VIII	
1	H											B	C	N	O	F	He	
2	Li	Be										Al	Si	P	S	Cl	Ne	
3	Na	Mg										Al	Si	P	S	Cl	Ar	
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
6	Cs	Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	+Ac	Rf	Ha	Sg	Ns	Hs	Mt	110	111	112	113					

- Radon is part of our natural environment, but can collect in homes built in radon-heavy areas.



# Ionization Radiation

- Rn emits energy. This energy is strong enough to damage molecules in your body. (Like DNA.) More energy = higher risk of damage to your DNA
- These small blasts of energy can be measured.
- Radon's alpha particles will pit plastic (100x)



# Public radioactive exposure risk

- Damage to your DNA can cause cells to replicate incorrectly. One type of incorrect cell replication is cancer.
- Because Radon is a gas, it affects the lungs.
- Radon is the greatest single source of radiation exposure for most people and is the #2 cause of lung cancer.
- The EPA has consistently ranked Radon among the top four public environmental risks.



# There is no safe amount of Rn

- ↑Radon = ↑damage to DNA = ↑risk of cell replication errors = ↑risk of cancer
- We have made an arbitrary determination that a level of radiation greater than 4 pCi/l is too risky in a home.

# Where is Rn found?

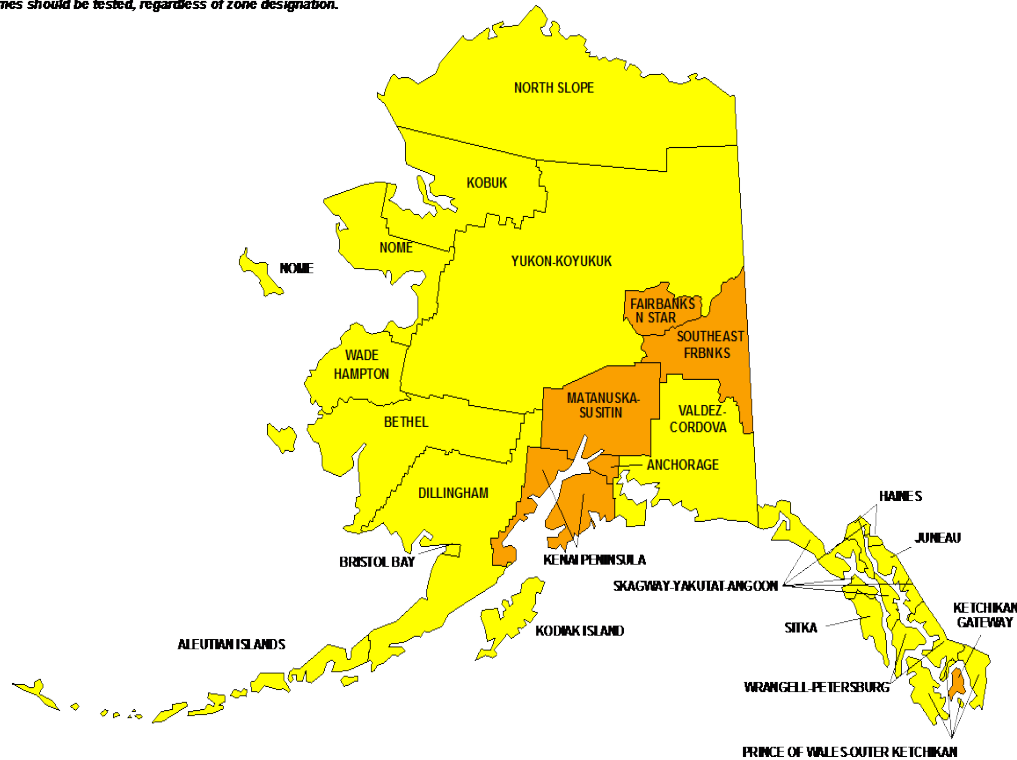
## ALASKA - EPA Map of Radon Zones

<http://www.epa.gov/radon/zonemap.html>

The purpose of this map is to assist National, State and local organizations to target their resources and to implement radon-resistant building codes.

This map is not intended to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones.

**All homes should be tested, regardless of zone designation.**



Zone 1



Zone 2



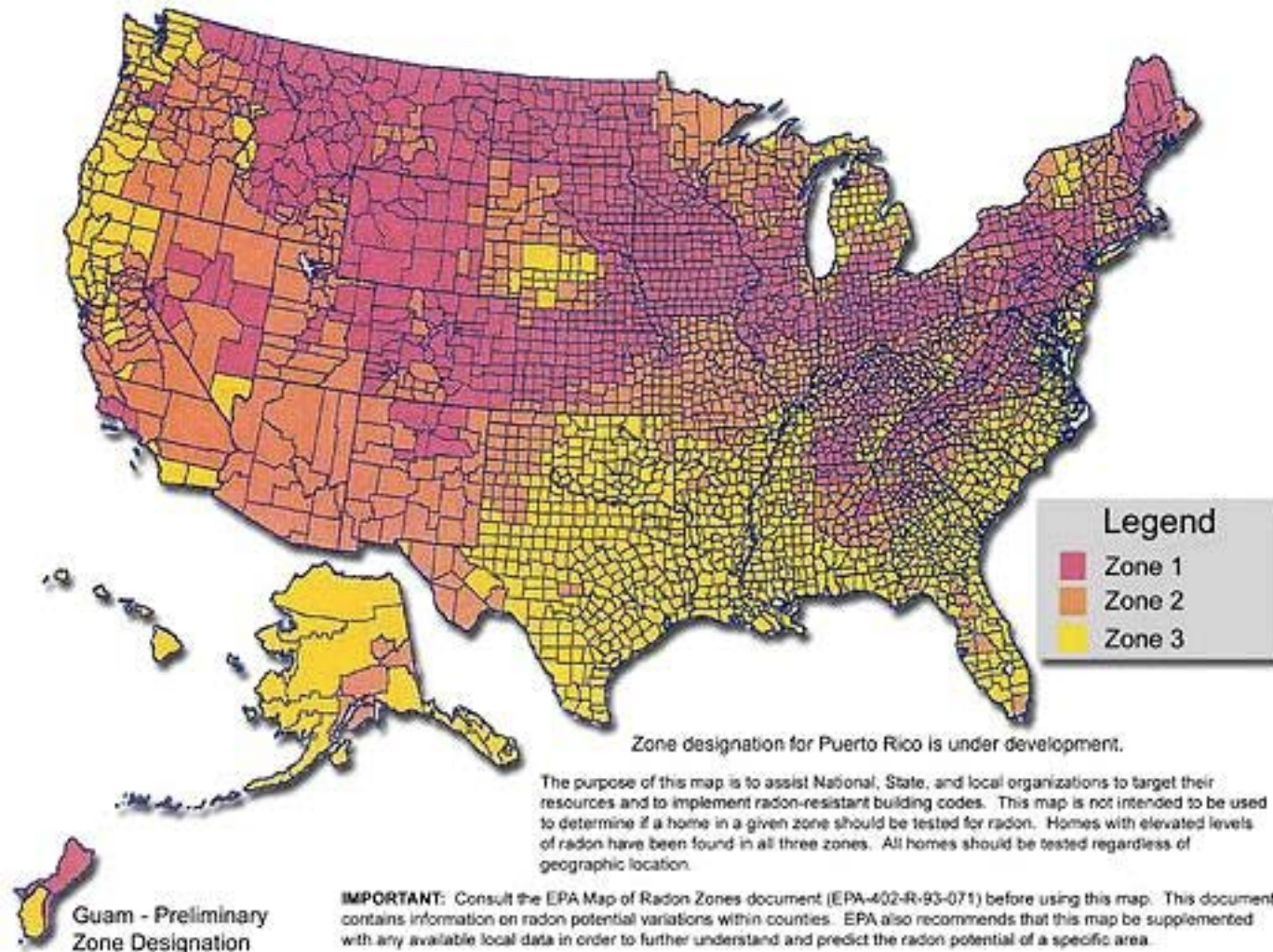
Zone 3

**IMPORTANT!** Consult the publication entitled "Preliminary Geologic Radon Potential Assessment of Alaska" (USGS Open-File Report 93-292-J) before using this map. <http://energy.er.usgs.gov/radon/grpinfo.html>. This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential of a specific area.



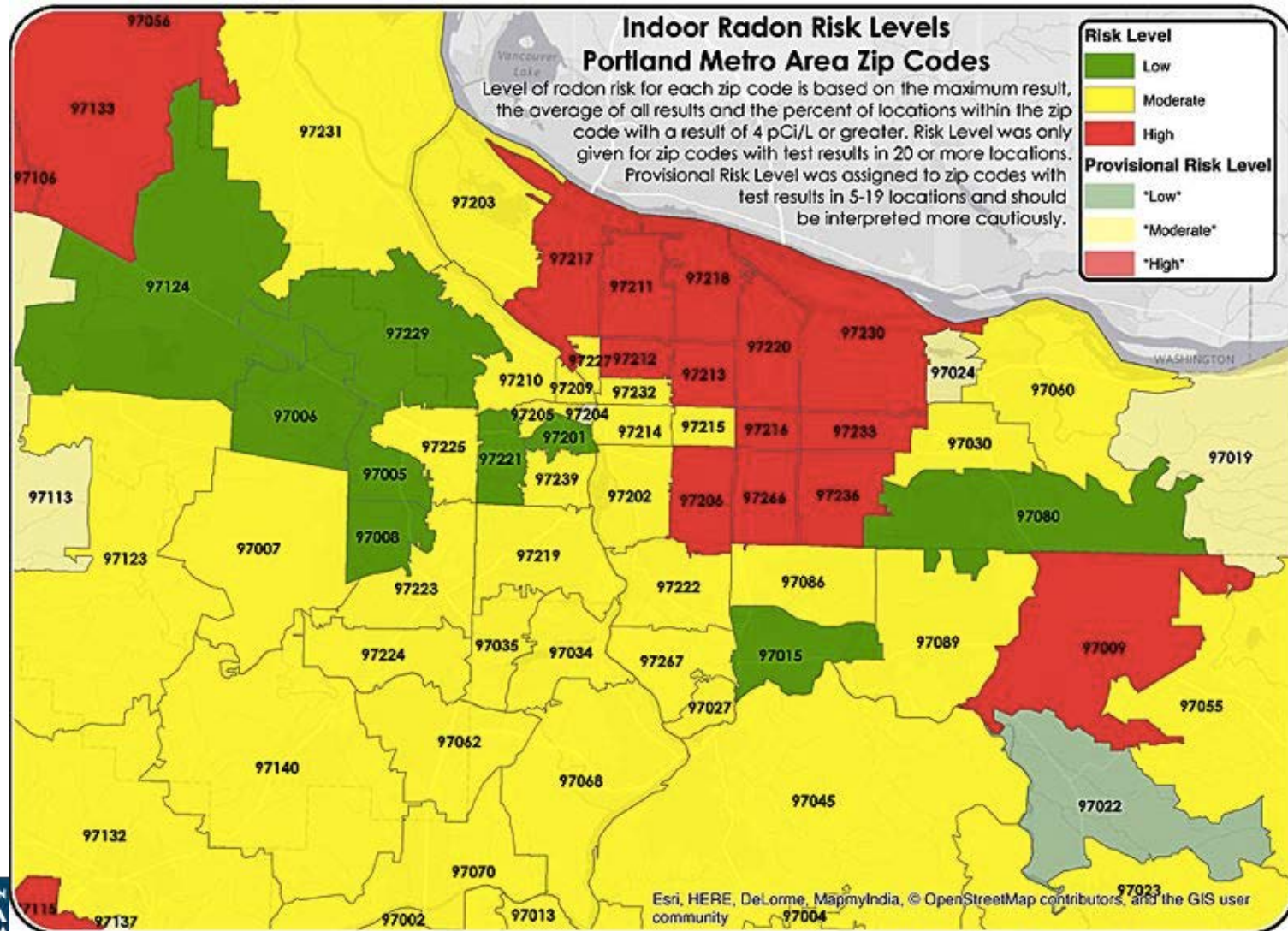
# Radon map: Lower 48

## EPA Map of Radon Zones





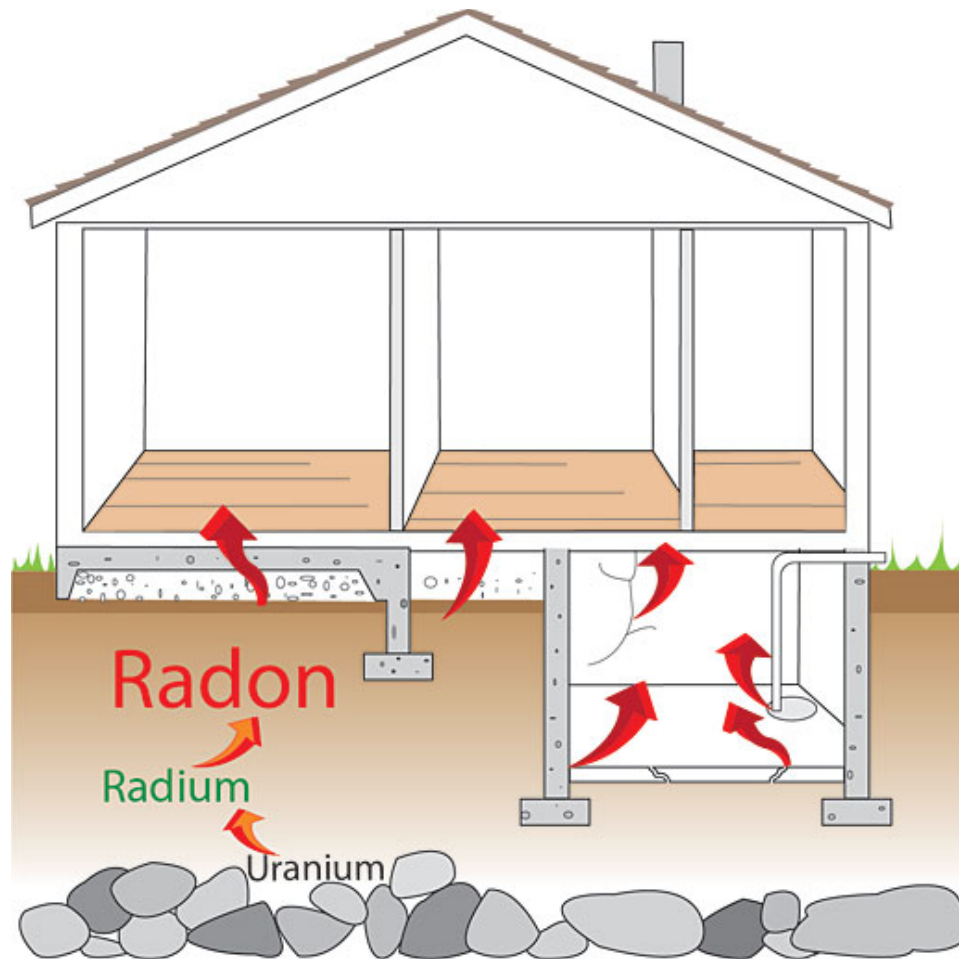
# Radon Map: local



# Every building's potential risk is unique, depending on:

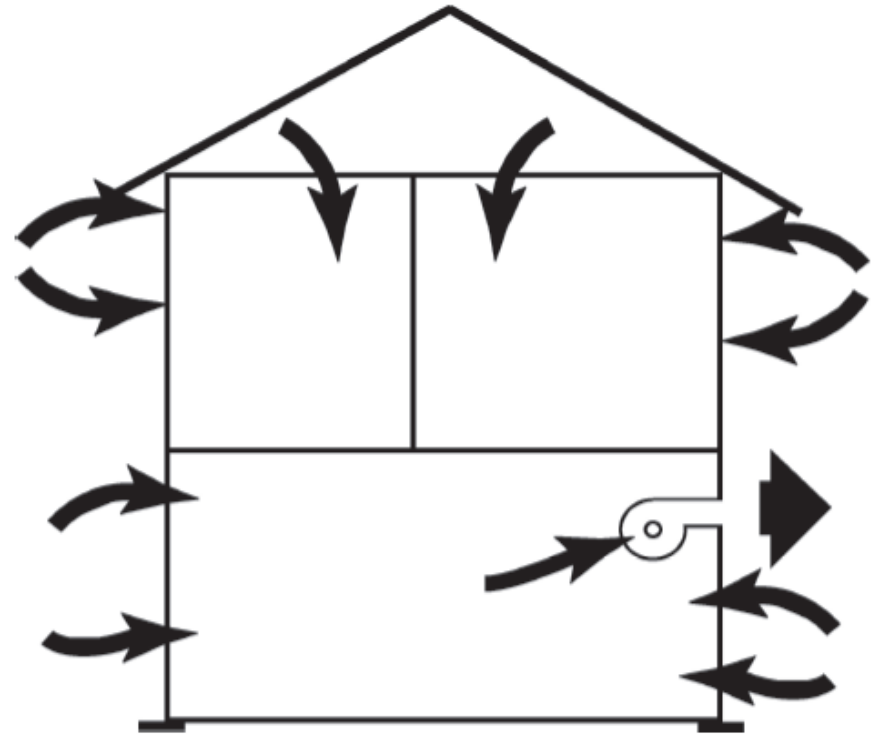
- Local soil
- Cracks and avenues in bedrock
- Construction contact of home to ground
- Pressurization of home (negative or positive)

# Rn enters a home through the soil



# Ventilation and Weatherization

- Changes to a home's envelope can affect radon
- Melting permafrost





# No contact with soil...





# Post and Pad!



# How do you know if you've got Radon?

- The only way to know is to test.
- Self tests- average taken from 2 -7 days by charcoal tray or 2 weeks- 1 year by alpha tract
- Hired test- around 3 days by electret ion box whereby you can get a dynamic readout
- Continuous monitor- plug in....reads 24/7



# How to test

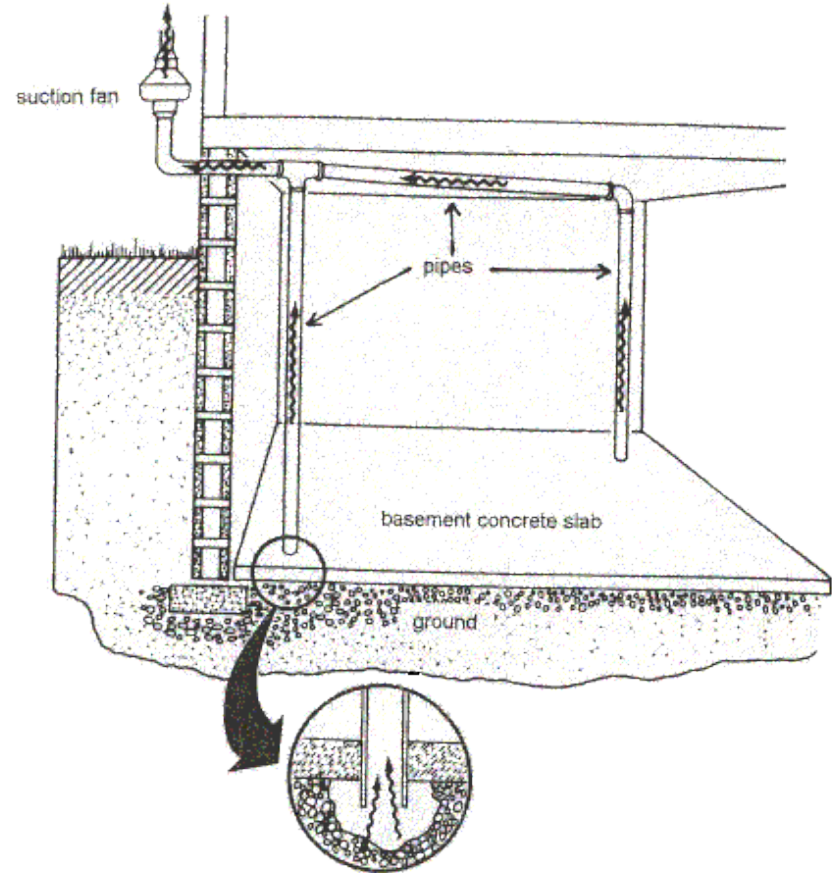
- Test when radon will be at the highest levels:  
During the heating season
- Longer tests give a clearer picture of radon levels
- Test on the lowest occupied level of the house
- Retest every 5 years (frequency depends on your situation)



If you test positive, block all cracks  
and test again....



# If that doesn't work, you may need a sub-slab ventilation system



# Summary

- Radon is a naturally occurring gas that causes cancer
- We do not have great data for Rn in the state of Alaska
- It is easy to test for Radon
- Once Radon is detected, it can be mitigated