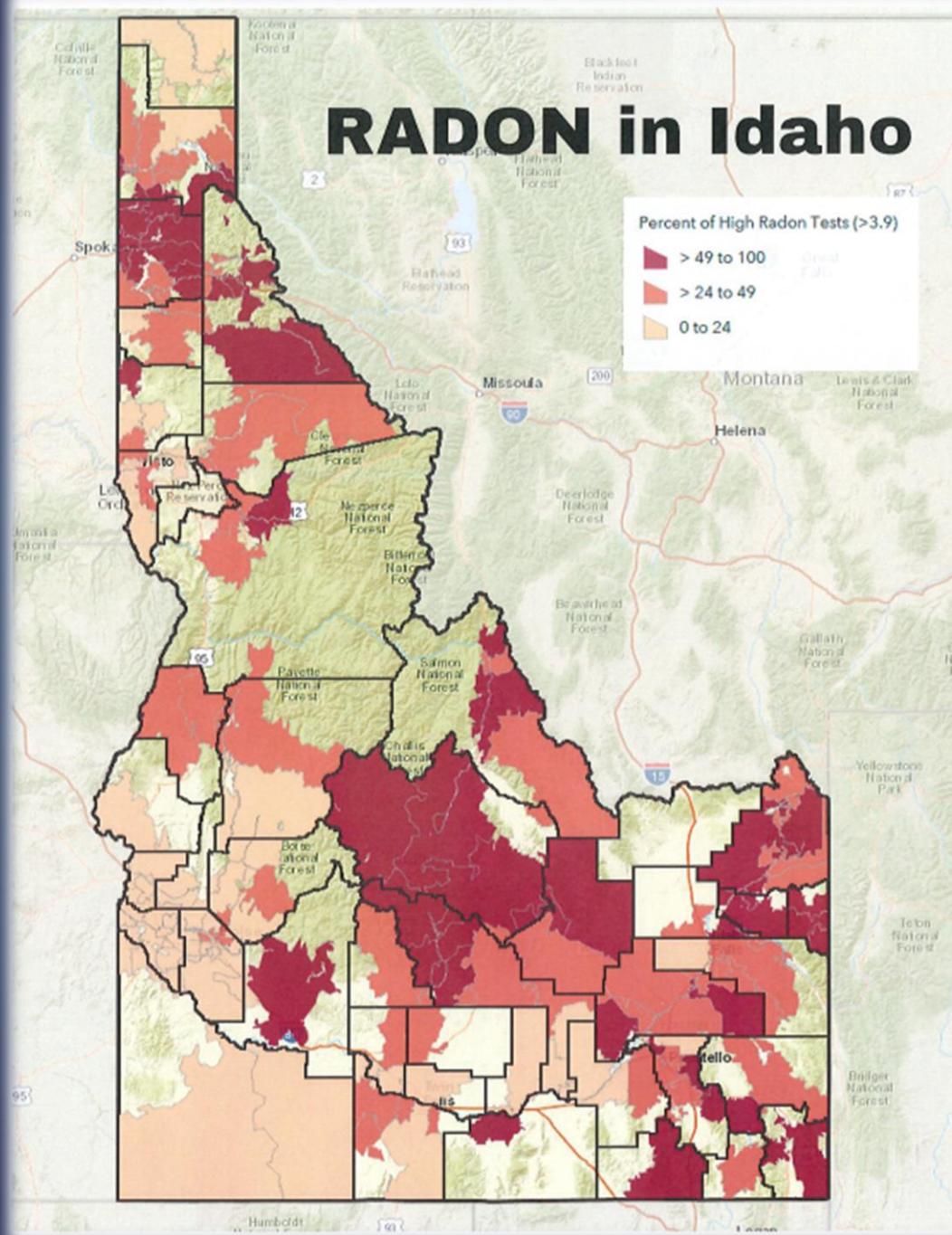


Radon in Idaho



IDAHO DEPARTMENT OF HEALTH & WELFARE
DIVISION OF PUBLIC HEALTH

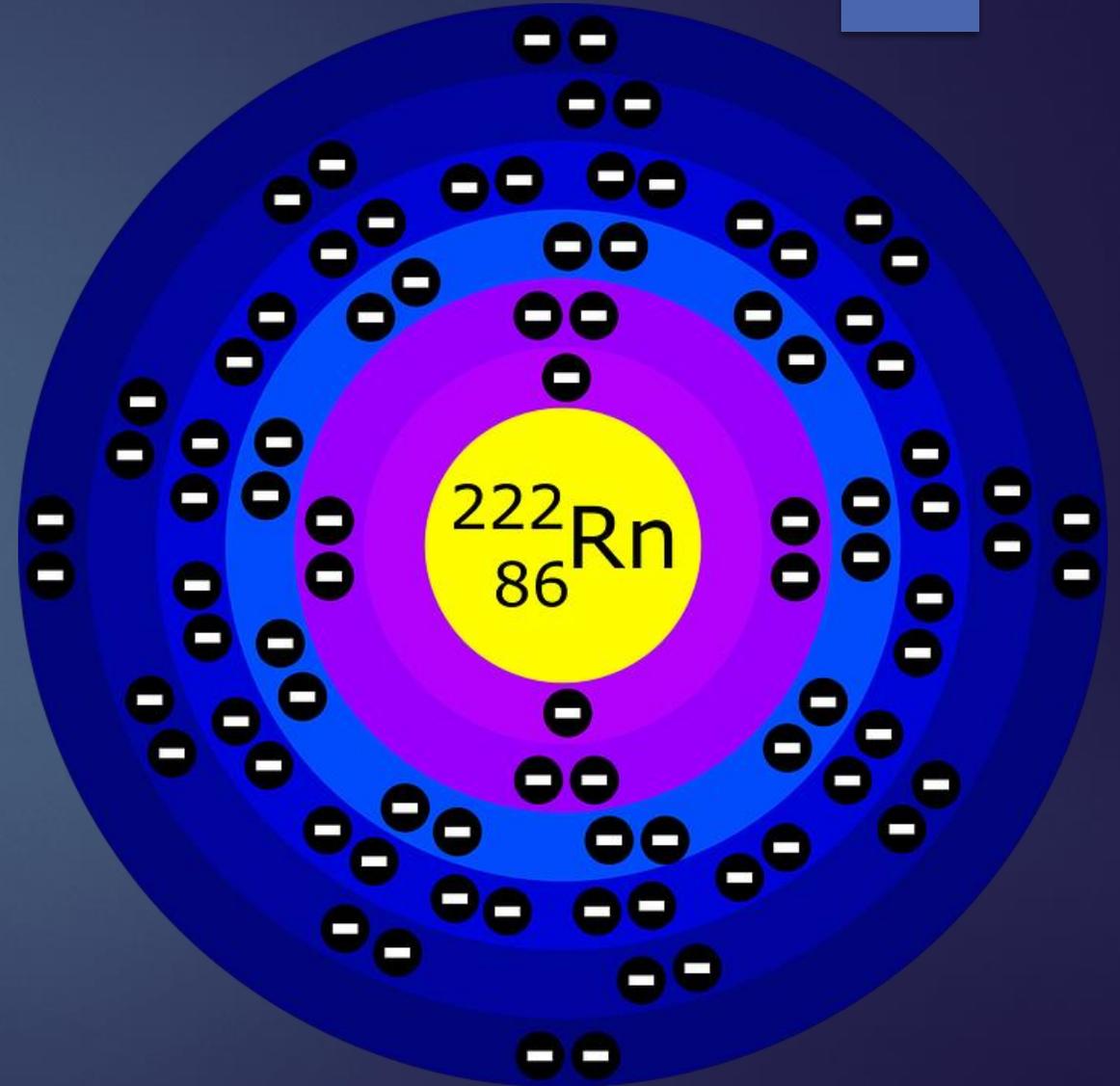
Learning Objectives

- ▶ Describe radon and its health effects.
- ▶ Explain how radon enters homes and how to test for it.
- ▶ Interpret radon test results.



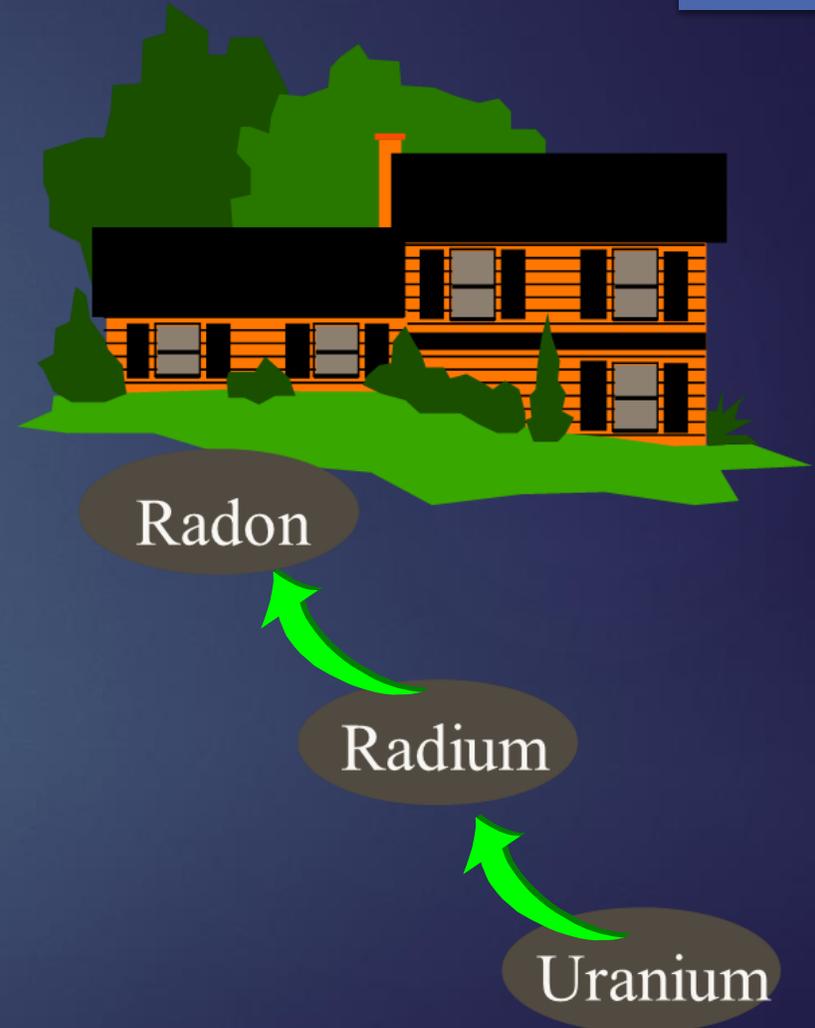
What is Radon?

- ▶ A radioactive gas that is colorless, odorless, tasteless, and invisible.
- ▶ Radon comes from the natural decay of uranium, which is found in nearly all soils.
- ▶ Radon is the second leading cause of lung cancer in the United States.



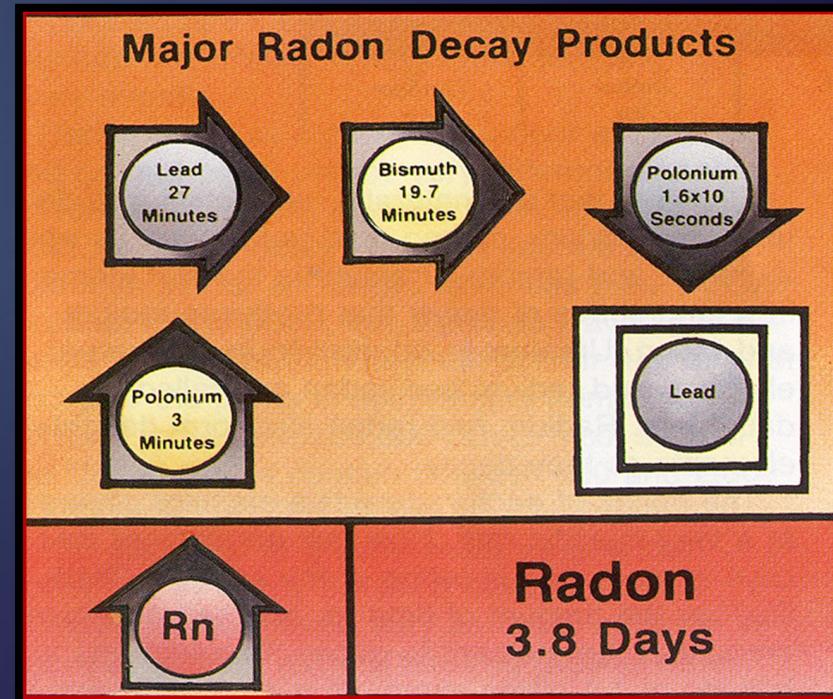
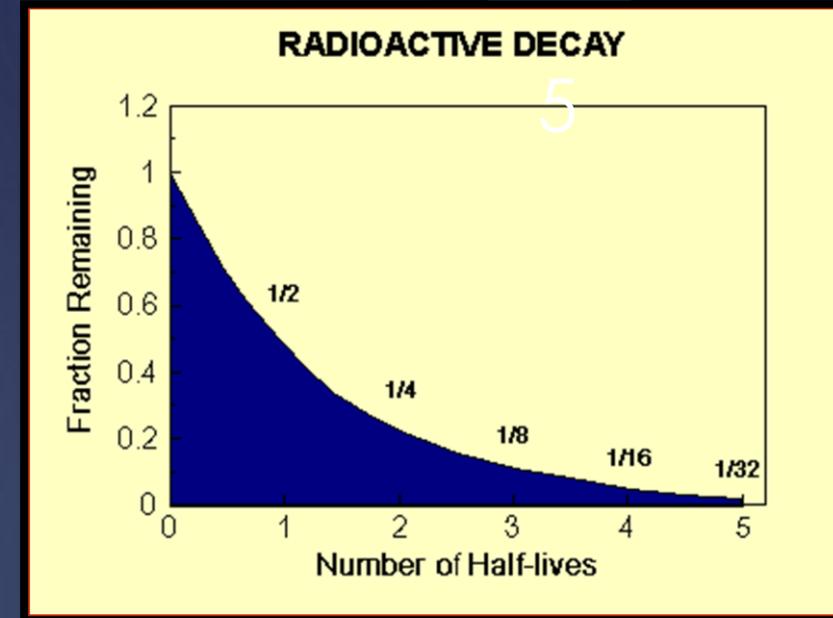
Radioactivity

- ▶ A property that causes some atoms to spontaneously give off energy as particles or rays.
- ▶ Radioactive atoms are unstable, and they release ionizing radiation as they break down.
- ▶ Radon gas is formed as uranium decays in the soil.



Half-Life & Radon

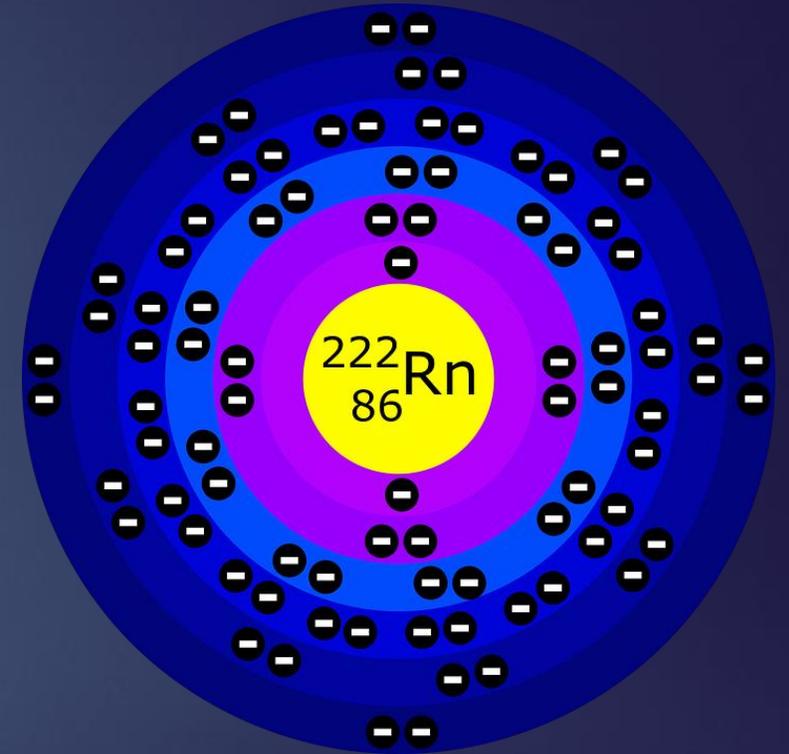
- A half-life is the amount of time it takes for one half of a given amount of radioactive material to disintegrate.
- Radon has a short half-life, only 3.8 days.
- As radon decays, its “progeny,” or decay products, gives off radiation.
- Lead is the last step in the radon decay chain and is not radioactive.



Learning Check!

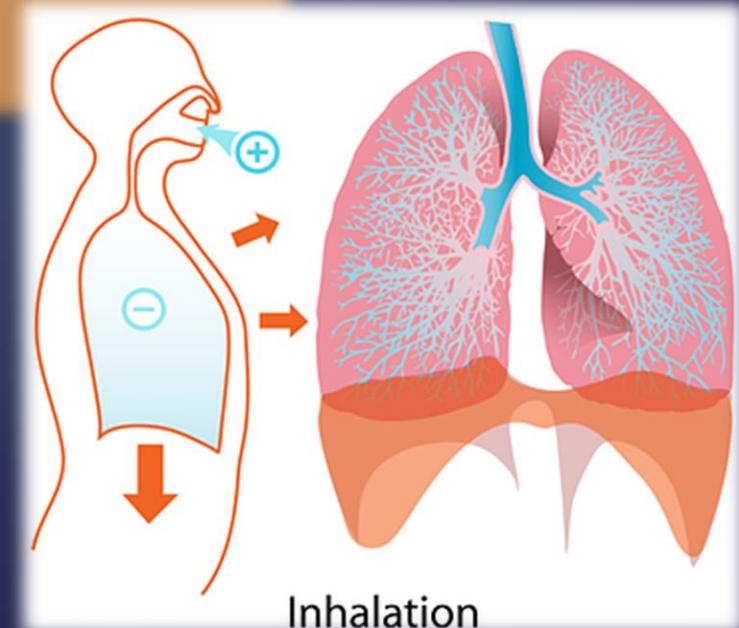
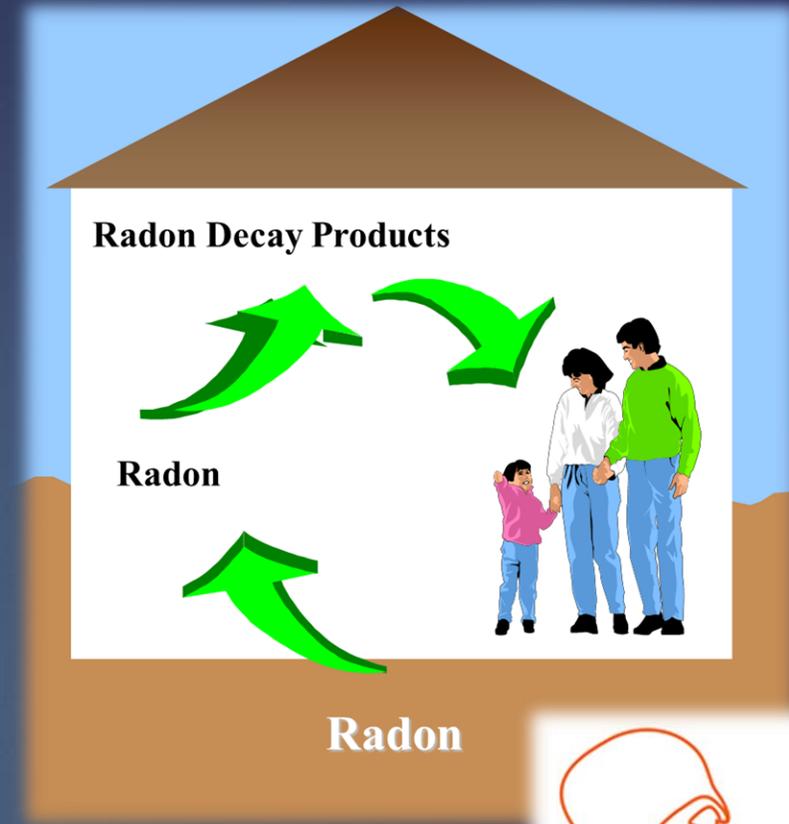
1. What is radon?
 - a) An odorless gas
 - b) A compact solid
 - c) A conductive metal
 - d) A man-made element

2. True or False - Radon is rarely found in U.S. soils.
 - ▶ Answer - False; Radon is found in nearly all soils in the U.S.



Health Effects

- ▶ Radon gas breaks down into radioactive particles that can attach to dust and substances in the air.
- ▶ These particles can then be inhaled into the lungs, where they can damage DNA and lung tissue.
- ▶ This damage can cause lung cancer.
- ▶ Radon is the second leading cause of lung cancer in the U.S. after smoking.



Lung Cancer Risk Due to Radon Exposure

Radon Level	If 1,000 people who smoked were exposed to this level over a lifetime*...	If 1,000 people who never smoked were exposed to this level over a lifetime*...
20 pCi/L	About 260 people could get lung cancer	About 36 people could get lung cancer
10 pCi/L	About 150 people could get lung cancer	About 18 people could get lung cancer
8 pCi/L	About 120 people could get lung cancer	About 15 people could get lung cancer
4 pCi/L	About 62 people could get lung cancer	About 7 people could get lung cancer
2 pCi/L	About 32 people could get lung cancer	About 4 person could get lung cancer



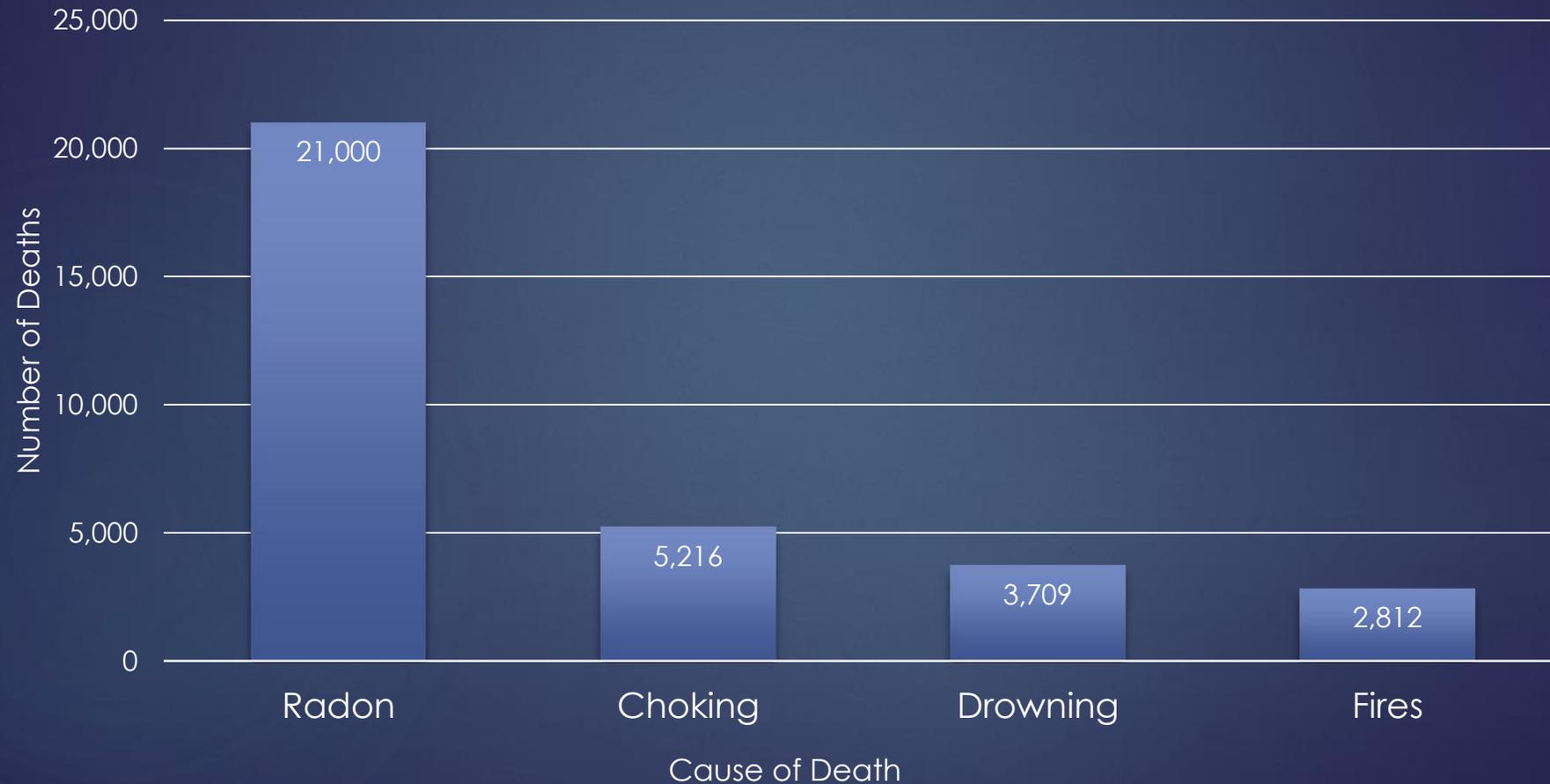
Did You Know?

- ▶ Top causes of accidental home injury deaths:
 - ▶ Choking
 - ▶ Drowning
 - ▶ Fires
- ▶ Deaths due to radon induced lung cancer is greater than all of these!



Leading Causes of Fatal Preventable Injuries

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Learning Check:

1. Radon is a known cause of what disease?
 - a) Diabetes
 - b) Asthma
 - c) Lung cancer
 - d) Lymphoma

2. Radon gas is dangerous when inhaled, because as it decays, the _____ can damage your DNA.
 - a) radiation
 - b) metals
 - c) lead
 - d) solids

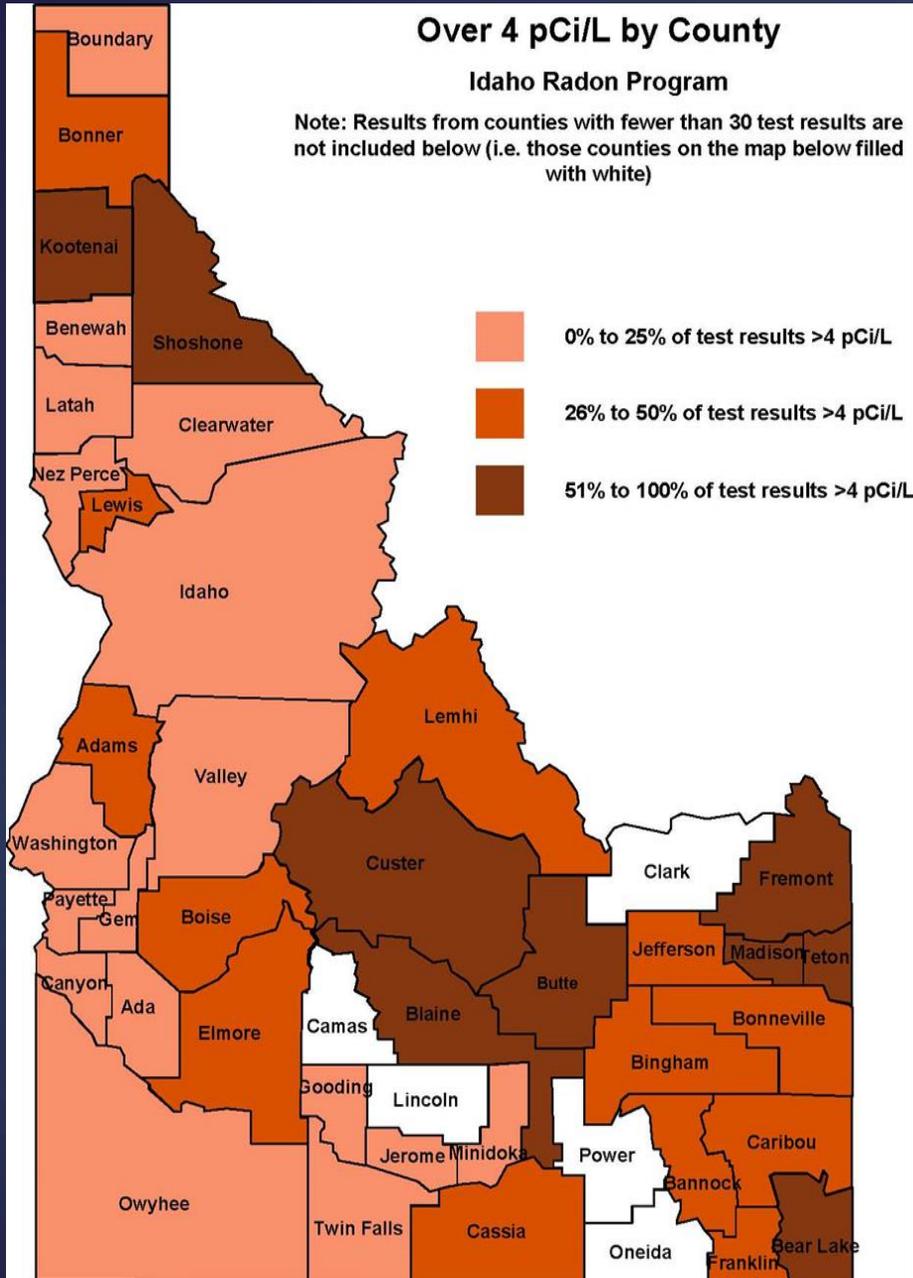


Radon Levels in Idaho

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- ▶ Radon is measured in picocuries per liter of air (pCi/L), a measurement of radioactivity.
- ▶ The average indoor radon level in U.S. is 1.3 pCi/L.
- ▶ 2 out of every 5 homes tested in Idaho have high levels of radon.
- ▶ The Environmental Protection Agency (EPA) and Surgeon General recommend that people not be exposed to radon levels over 4 pCi/L.





Percent of Idaho Homes with Radon Samples >4 pCi/L by County



Radon in Homes

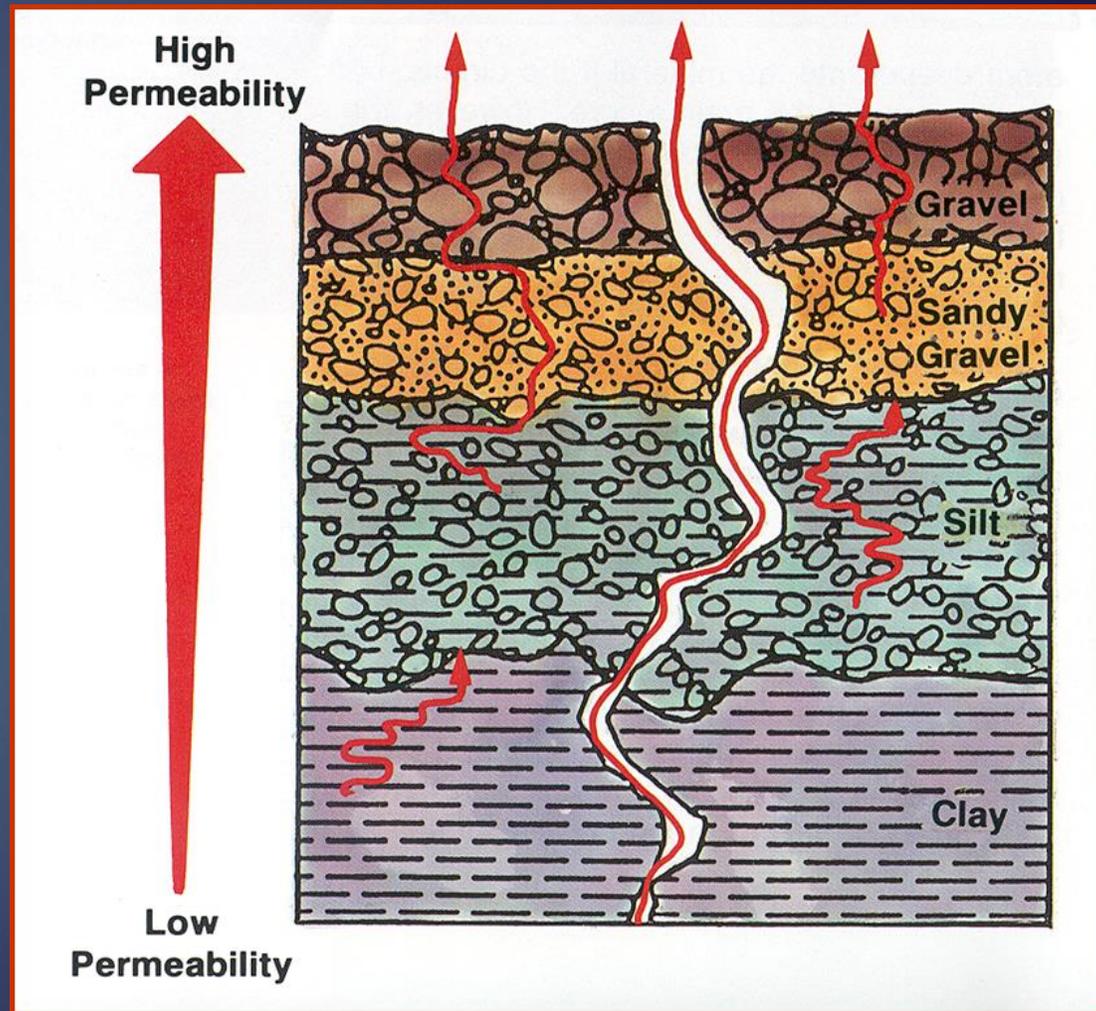
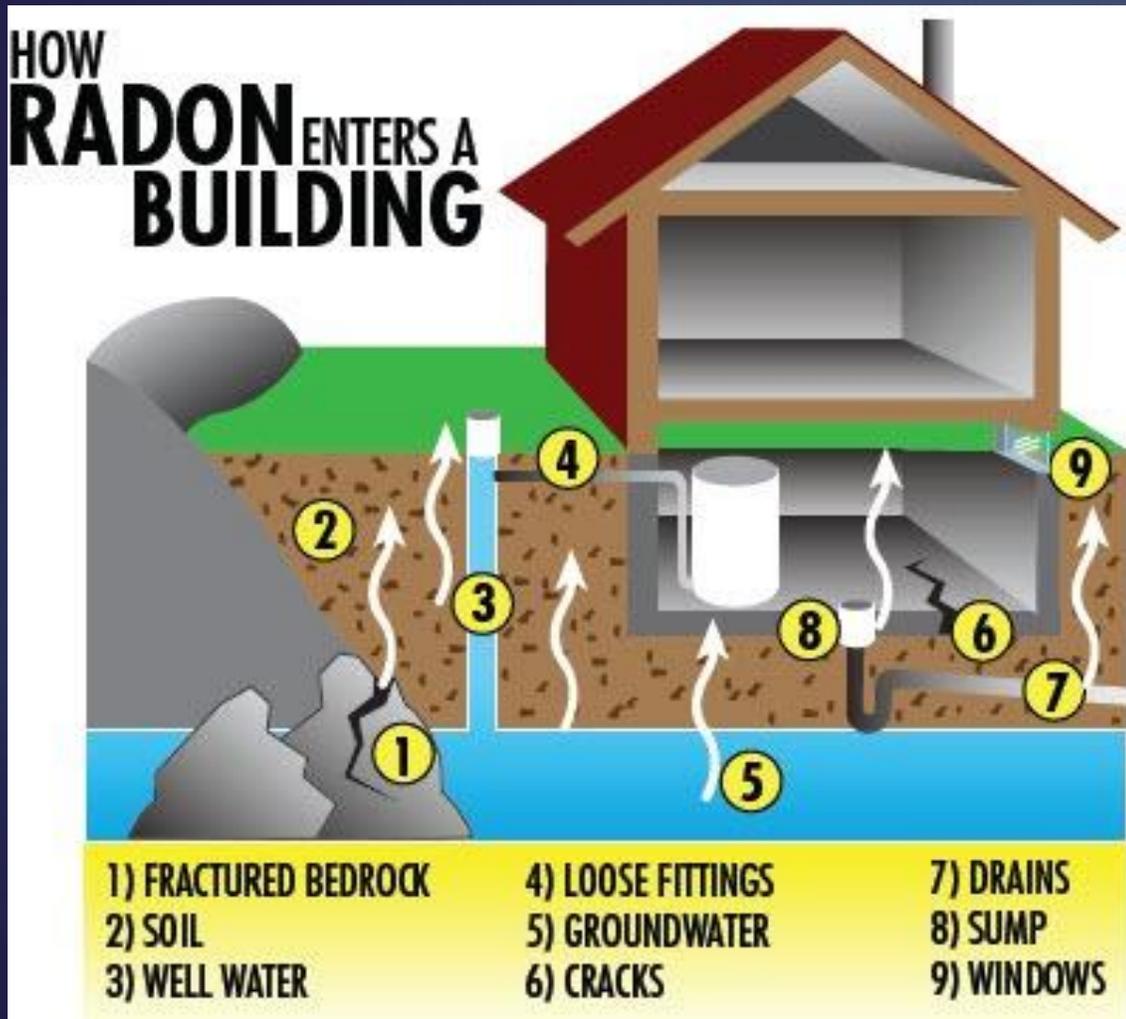
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- ▶ Radon gas moves freely and can get into homes through cracks and holes in the foundation.
- ▶ Radon levels can change based on environmental effects and the home's infrastructure.
- ▶ Radon is found in ALL types of homes.



How Does Radon Enter Homes?



Learning Check:

1. True or False? The only way to know the levels of radon in a home or building is to test.
 - ▶ Answer-True! Radon can be present in a home, regardless of age or type of construction.
2. How does radon enter a home?
 - ▶ Answer-Radon enters homes through cracks or holes in the foundation. It can also enter through water and loose fittings.



Radon Testing Methods

- ▶ Continuous air monitoring
- ▶ Activated charcoal sampler
- ▶ Short-term (2 days - 3 months)
- ▶ Long-term (>3 months)
 - ▶ Recommended over the winter season



Short-Term Radon Test Kit

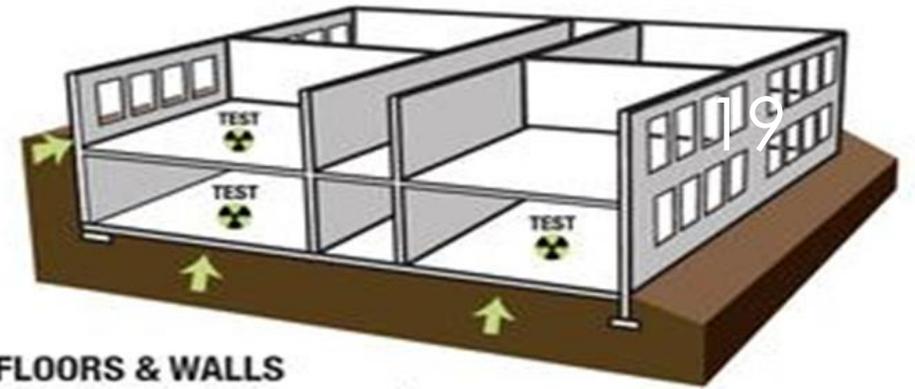
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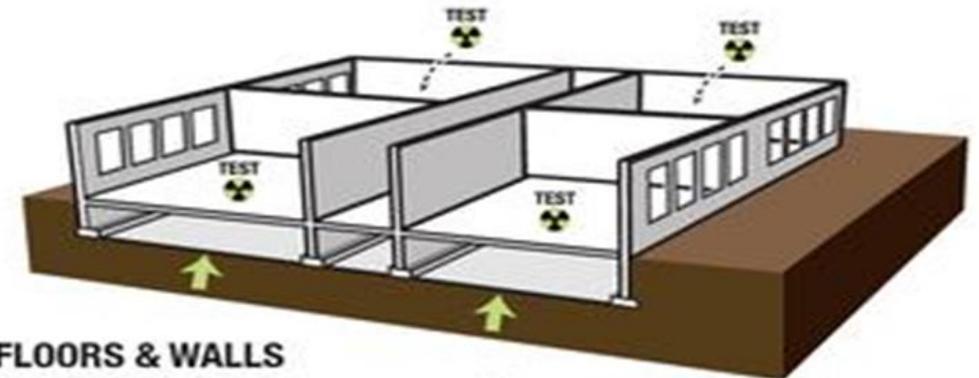
- ▶ Testing is easy!
- ▶ Open the package & place the test kit in the recommended location for several days.
- ▶ Send the test kit to the address on the package.
- ▶ You will receive your results in about 2 weeks.

Radon Testing Recommendations

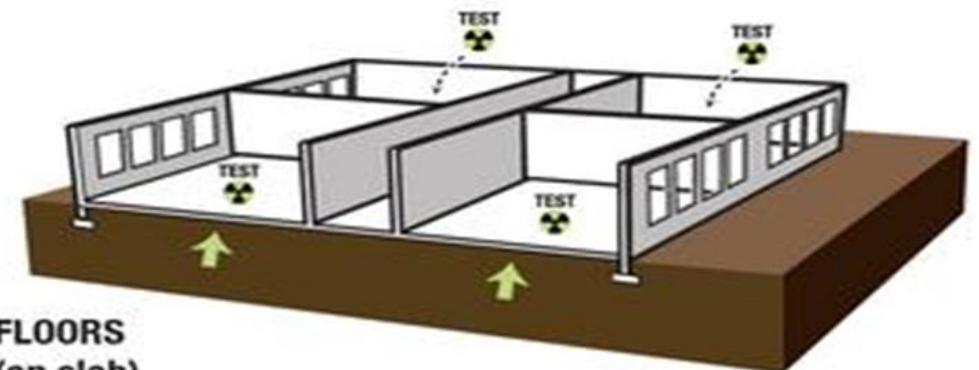
- ▶ Test during winter months, when radon levels are highest.
- ▶ Test at the lowest level of the home designed for living: basement or first floor.
- ▶ Test one level above crawlspaces and garages.



FLOORS & WALLS
(basement or upper area)



FLOORS & WALLS
(over crawl spaces or garages)



FLOORS
(on slab)



Radon Test Results & Recommended Actions

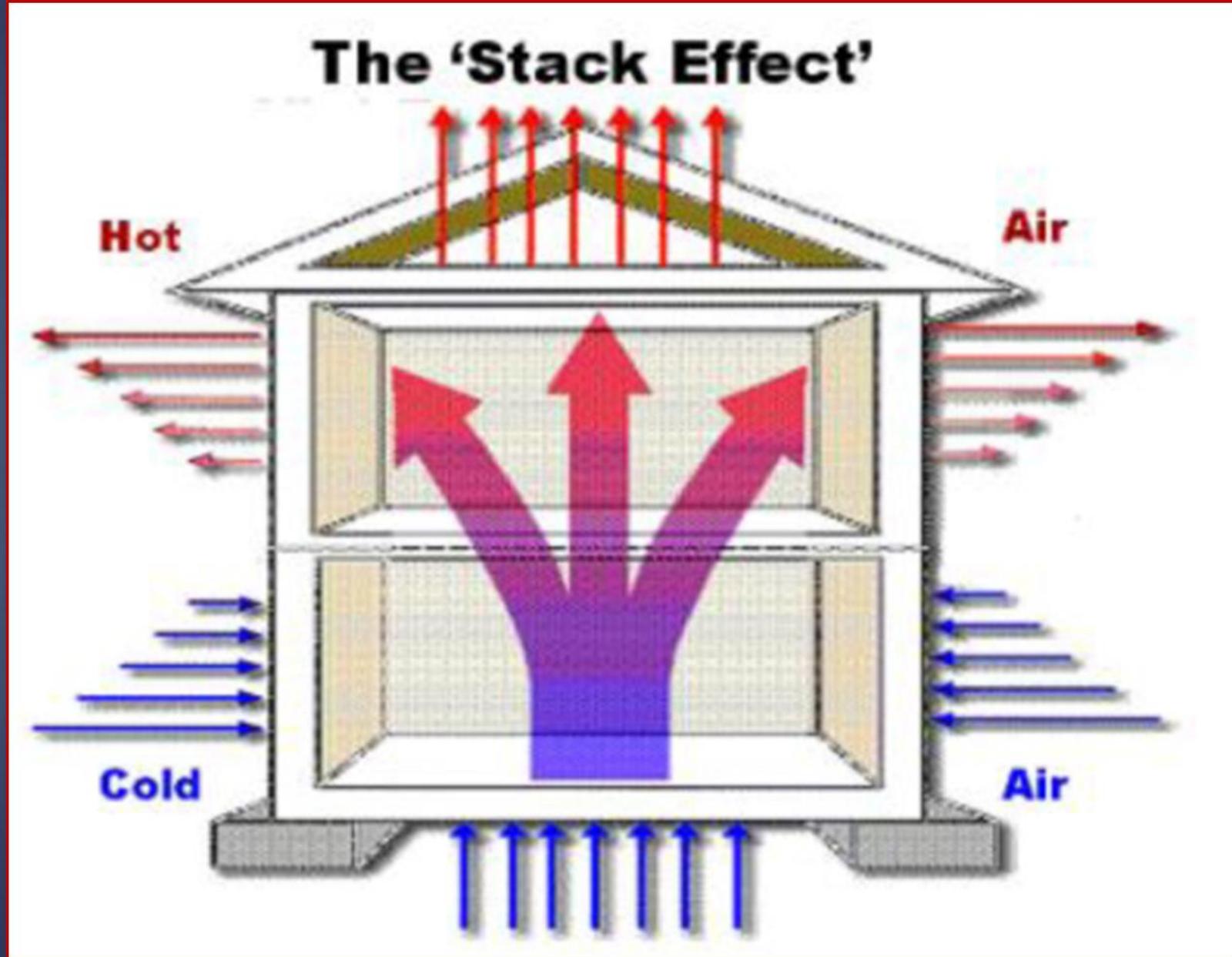
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<u>Radon Level</u> (pCi/L)	<u>Recommended Action</u>
0.4 - 1.9	No action recommended. Radon levels can change over time, so test again every 5 years or after a remodel.
2.0 - 3.9	Consider running a long-term radon test. Consider fixing your home.
4.0 and higher	Fix your home! You can do this yourself or hire a radon mitigation professional.



Why Can Radon Levels Change?

- ▶ Changes in Air Pressure:
 - ▶ Daily
 - ▶ Seasonal
 - ▶ Weather
- ▶ Infrastructure:
 - ▶ Exhaust fans
 - ▶ Appliances



Learning Check: What would you do?

1. Sally tested her home for radon. She placed a short-term test in her downstairs bedroom. After 2 weeks, the results said that her home tested at 4.2 pCi/L. What should she do?
2. George ran a short-term radon test. He put the test kit in his upstairs bedroom. The test results came back at 3.6 pCi/L. What should he do?
3. Felipe tested his home for radon and his results were 1.4 pCi/L. What advice would you give to him?



Fixing Your Home

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- ▶ Do not panic! Radon levels can easily be brought down to 2 pCi/L or lower.
- ▶ Fixing your home is called “radon mitigation.”
- ▶ You can hire a certified radon mitigation specialist to fix your home, or you can choose to do it yourself.
 - ▶ Manuals and DIY-videos are available online.



Sub-Slab Depressurization

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- ▶ This is the most common method for reducing radon levels
- ▶ Suction created by a fan actively draws radon gas from beneath the home and safely vents it outside.



Learning Check:

1. True or False? It is difficult to lower the levels of radon in a home.
 - ▶ Answer: False. Reducing radon levels to below 2 pCi/L is easy to do.
2. True or False? If radon levels are high, you can either fix your home yourself or hire a professional to install a mitigation system.
 - ▶ Answer: True! For people who are handy, information about radon mitigation is available online. For those who would prefer to hire a professional, make sure they are either certified or familiar with radon reduction techniques.



How can I test my home for radon?

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- ▶ Idaho residents can purchase a short-term test kits from AirChek for \$10.
- ▶ Call 1-800-247-2435
- ▶ Visit www.radonidaho.org for more information.



- ▶ Radon is a health risk worldwide. There is no known safe level of radon.
- ▶ You cannot know the level of radon in your home based on your neighbor's results. Every home is different. The **ONLY** way to know is to test.
- ▶ All homes have a risk for high levels of radon, regardless of age and type of home construction.
- ▶ Radon levels can easily be lowered to reduce health risks.
- ▶ Homes should be re-tested for radon every 5 years.

