RADON & RADIATION

WHAT IS RADON?

- Radon is an odorless, invisible, tasteless, radioactive gas found in nature.
  - Radioactive means that it emits radiation when the atoms spontaneously change into different atoms.
- Radon builds up in many homes and buildings and can be a health hazard for you and your family.

HOW RADON IS FORMED

URANIUM:

- Is a radioactive element that was present when Earth formed – and still exists today!
- When uranium breaks down (decays) it forms radium.
- When radium breaks down (decays) it forms **radon.**

How Radon Affects Your Health

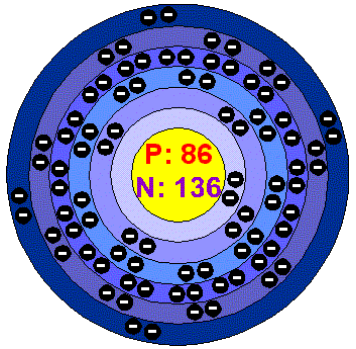
- **Radon** is the leading environmental cause of cancer mortality.
- **Radon** kills about 20,000 people in the U.S. every year.
- **Radon** is the leading cause of lung cancer in non-smokers.
  - Smokers exposed to radon double their risk of getting lung cancer.

HOW RADON AFFECTS YOUR HEALTH

- When we breathe, **radon** decay products may become trapped in our lungs.
- **Radon** can damage lung tissue cells and increase the risk of lung cancer.
- Our risk of developing lung cancer from breathing radon depends on two factors:
  - the amount of radon in the air that we breathe
  - how long we breathe air containing radon decay products

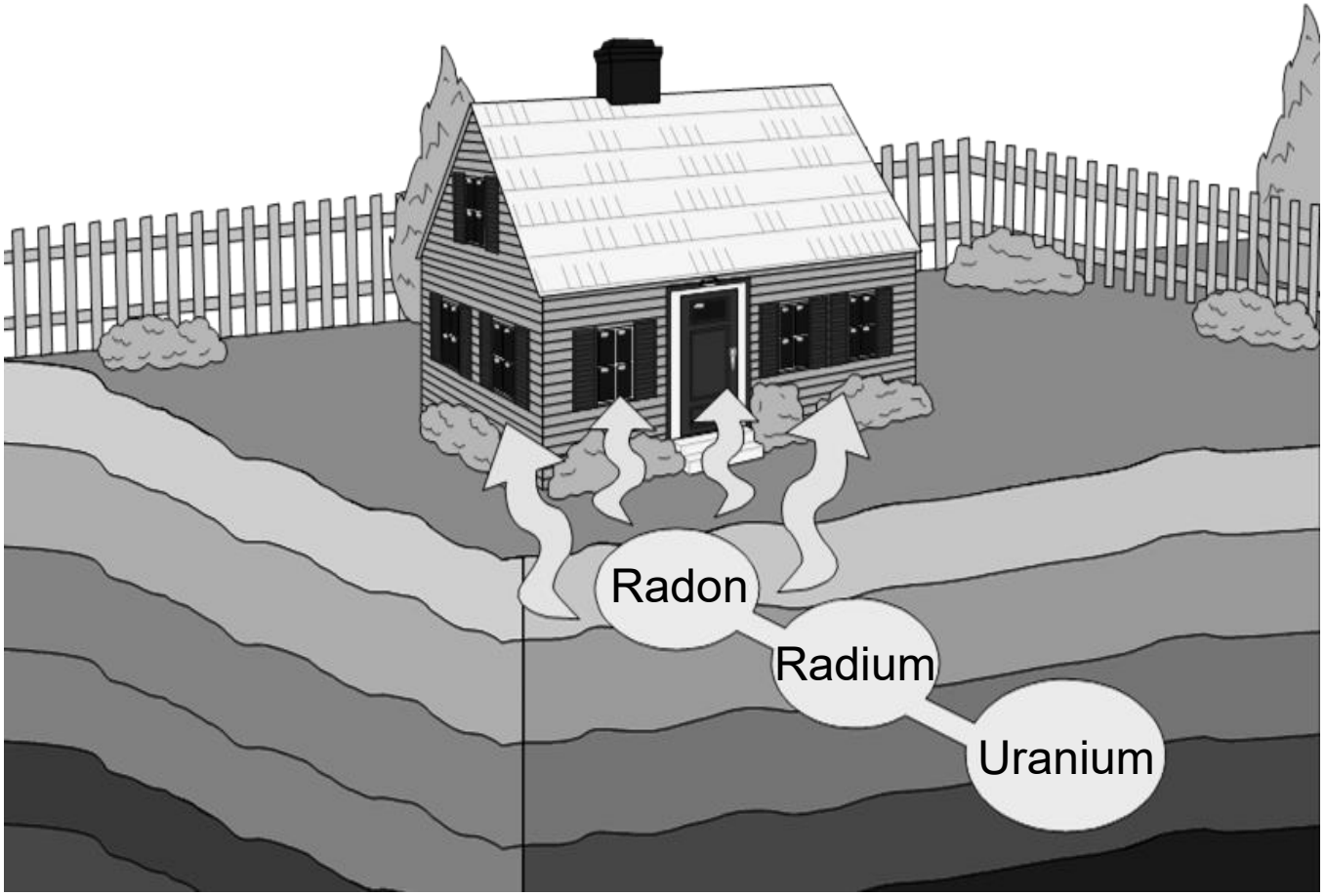
HOW RADON DAMAGES CELLS

- **Radon** gas can be inhaled and exhaled.
- **Radon** decay products cling to dust particles in the air which can be inhaled into your lungs and remain stuck to your lung tissue.
- As **radon** breaks down it emits radiation.
- Ionizing radiation strike cells causing physical and/or chemical damage to DNA.



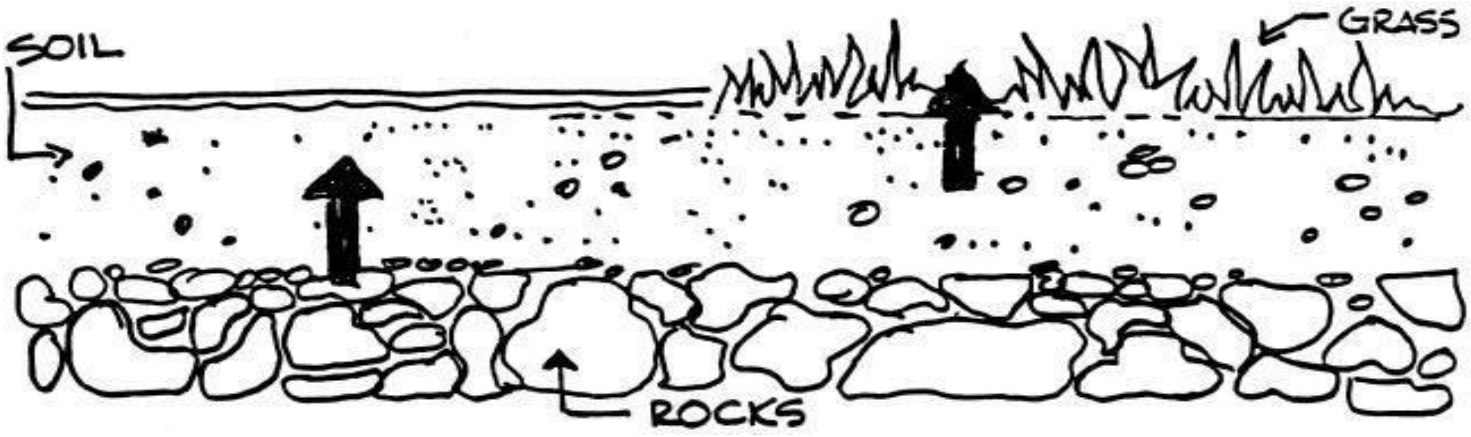
RADON IN THE HOME

HOW RADON GETS INTO HOMES



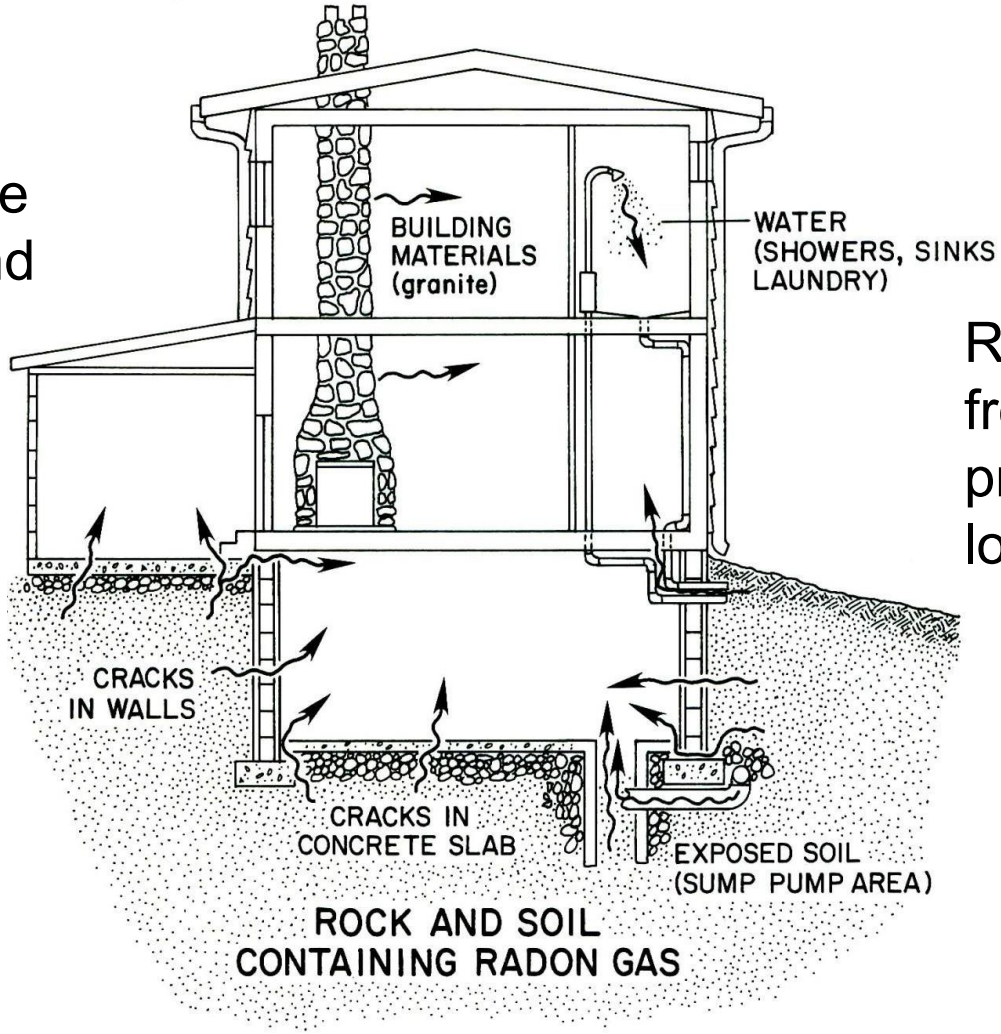
HOW RADON GETS INTO HOMES

- First, it travels in small spaces in soil and rock under our homes.
- Then, it gets drawn into a home through dirt floors, crawl spaces, cracks and pores in floors and walls.



WHAT CAUSES HIGHER RADON LEVELS IN HOMES

Pressure differences are created around a house

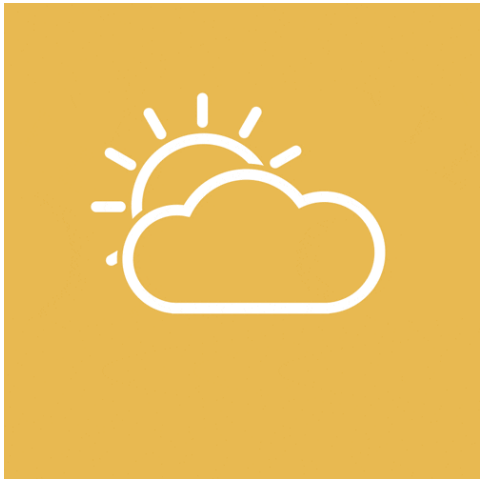


Radon moves from high pressure to low pressure

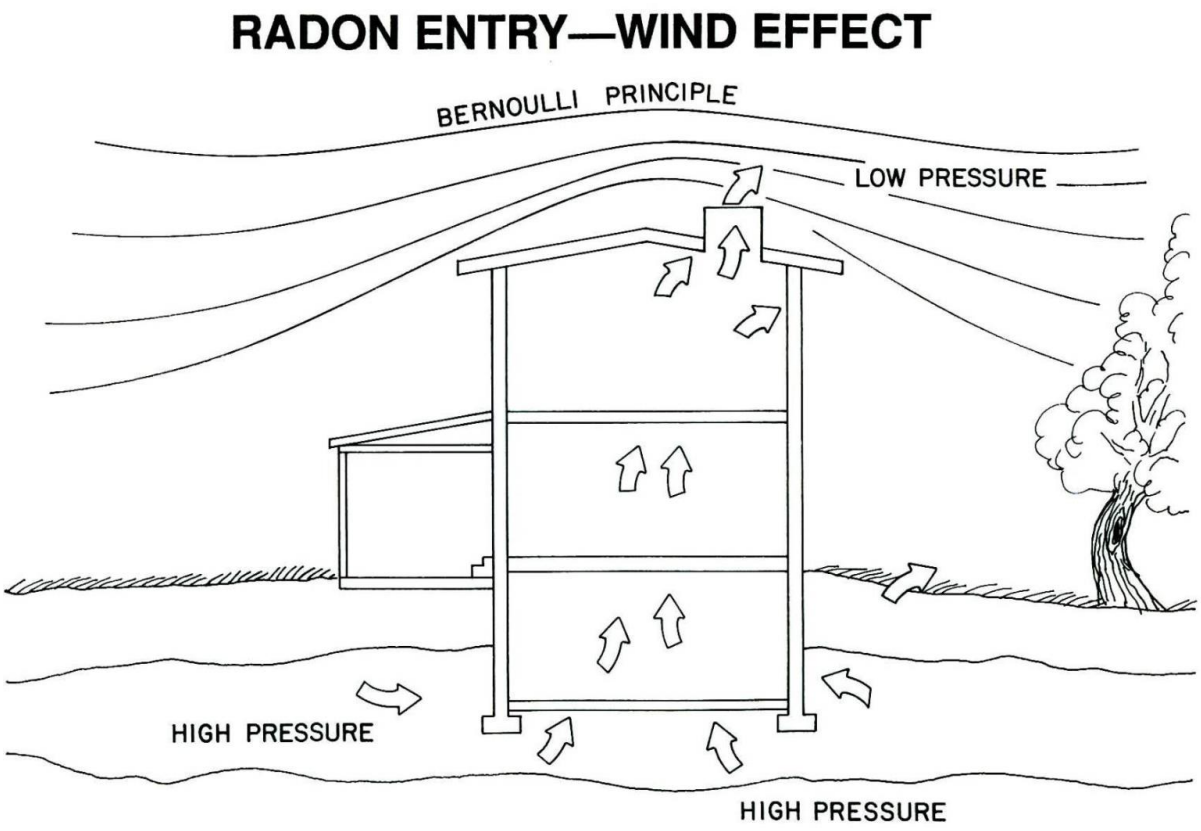
WHAT CAUSES HIGHER RADON LEVELS IN HOMES

Weather Factors:

- High Winds
- Rain
- Warmer indoor temperatures than outside

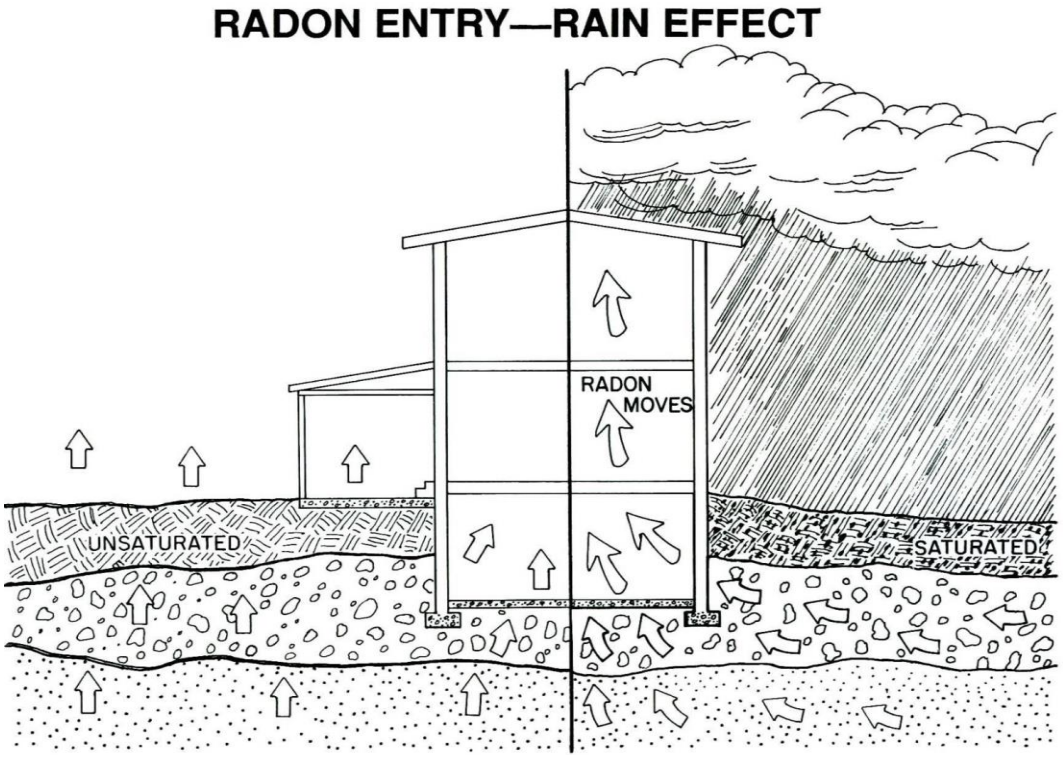


WHAT CAUSES HIGHER RADON LEVELS IN HOMES



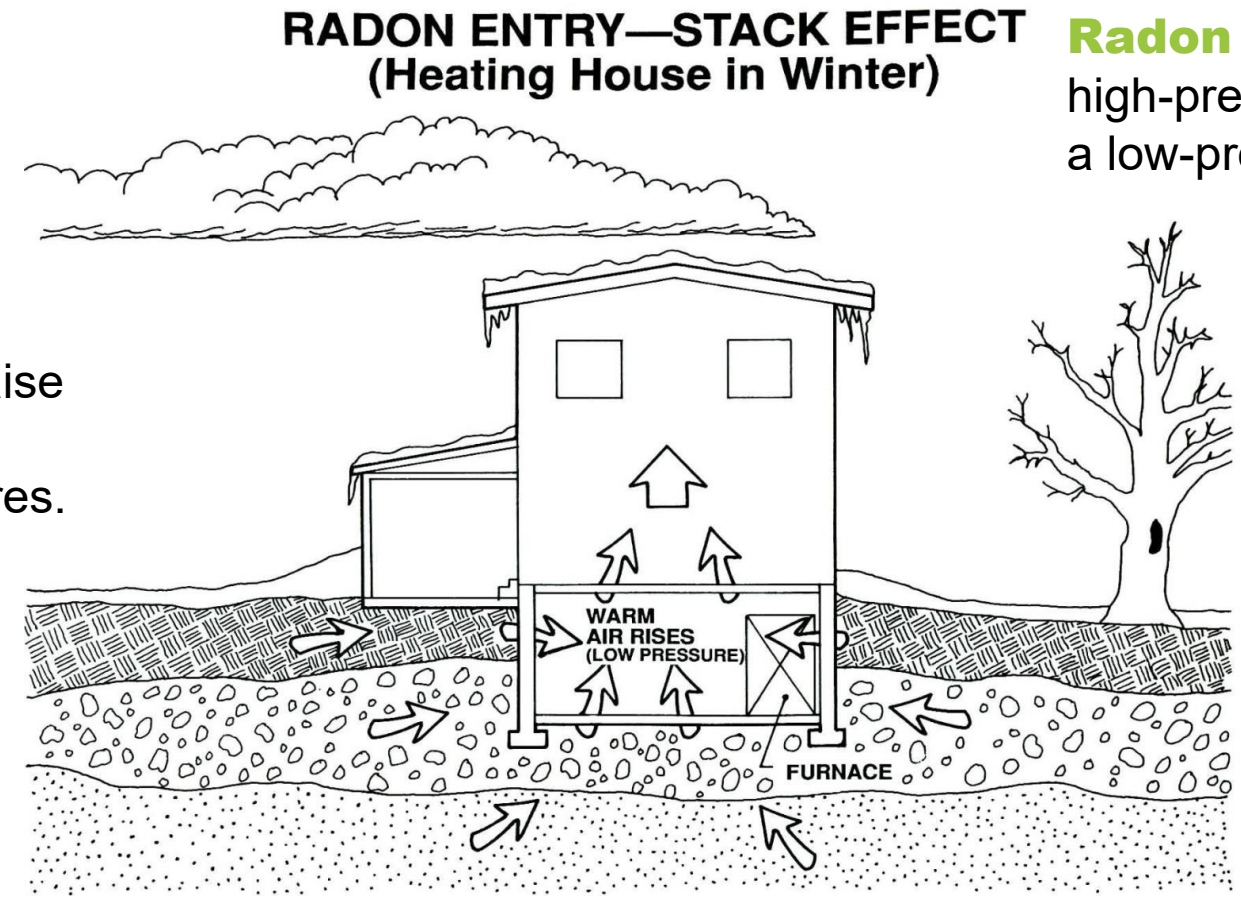
Radon moves from a high-pressure area to a low-pressure area

WHAT CAUSES HIGHER RADON LEVELS IN HOMES



Rain fills the spaces and “caps” the **radon** from escaping the exposed soil, but **radon** will move to the dry spaces underneath the house.

WHAT CAUSES HIGHER RADON LEVELS IN HOMES



Radon moves from a high-pressure area to a low-pressure area

Heating systems raise indoor air temperatures.

WHAT CAUSES HIGHER RADON LEVELS IN HOMES

Building Design Factors:

- Air flow through vents and chimney

Activities Within Building:

- Central forced air systems
- Combustion appliances
- Exhaust fans

Result in lower pressure inside

RADON TESTING

HOW TO TEST FOR RADON

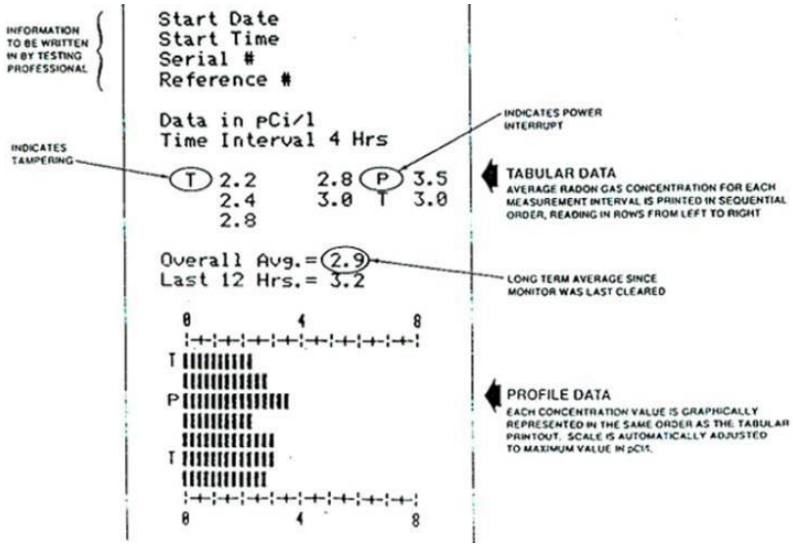
Charcoal Radon Detection Devices

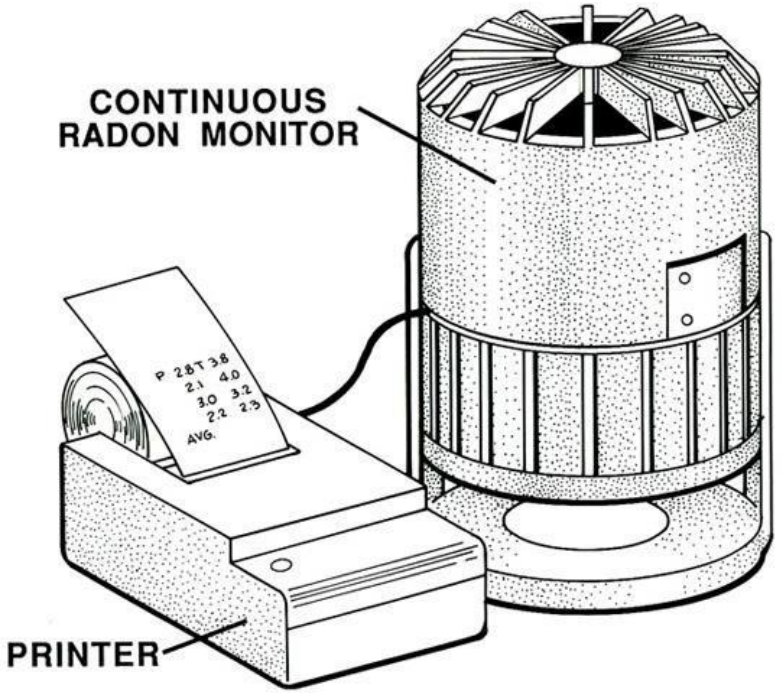
- Short-term tests
- Low cost
- Easy to use
- Found in most hardware stores

HOW TO TEST FOR RADON

Continuous Radon Monitor

- Provides a better year-round average of **radon** levels
- 91 days -1 year





HOW RADON IS MEASURED

- Picocuries per liter of air (pCi/L)
- EPA action level is 4.0 pCi/L **or more**
- **No level of radon is safe**

WHAT TO DO IF YOUR HOME HAS HIGH RADON LEVELS

- Not all homes or buildings have the same **radon** level.
- One home may have a low level while the home next door may have a high level.

Testing Is The Only Way To Know

100 pCi/L

1.25 pCi/L

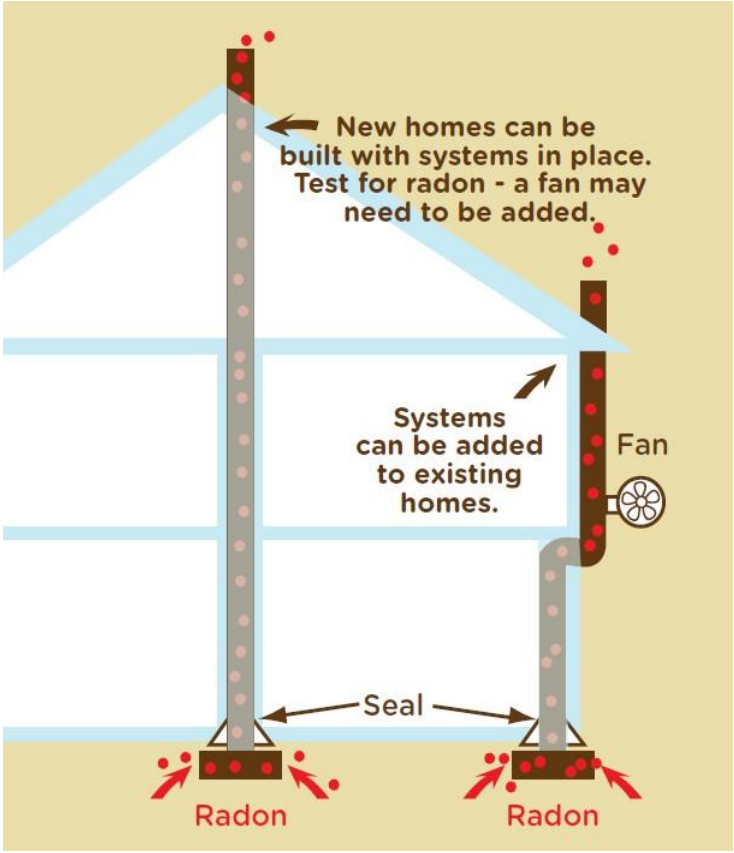
25 pCi/L

???

WHAT TO DO IF YOUR HOME HAS HIGH RADON LEVELS

A “radon mitigator” is trained to lower radon levels in homes and buildings. A radon mitigation system may include:

- plastic pipe extending from basement to above the roof
- fan to suck the radon from the ground, into the pipe, and out into the air above the roof



Colorado Department of Public Health: infographic (2018). *Is Your Home Safe from Radon.* [PDF]

THIS PRESENTATION WAS ADAPTED FROM THE FOLLOWING RESOURCES

- Connecticut Department of Public Health, Mrs. Sullivan: radon lesson (no date). Radon Lesson. [PowerPoint presentation]
- DESP 3R's: teacher resource (no date). Unit 3: What is Radon? [Word document]
- EPA: radon overview (no date). Education Outreach packet. [powerpoint presentation]
- Utah Department of Environmental Quality, Eleanor Divver: radiology lesson (no date). Radiological Basics. [PowerPoint presentation]