



Radon & Cancer Comic Book

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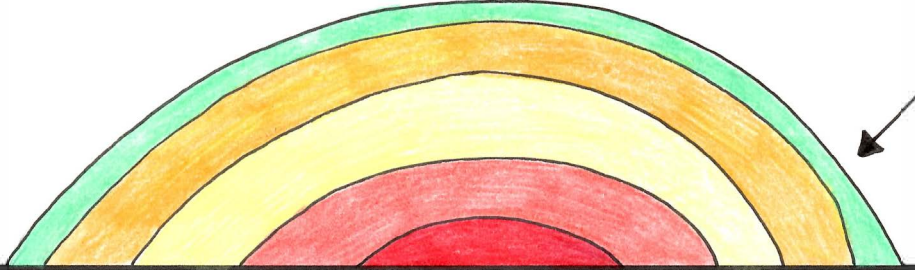
HI STUDENTS!
THROUGHOUT THIS
COMIC BOOK, WE ARE
GOING TO LEARN
ABOUT RADON AND
CANCER!



AS YOU WORK
THROUGH THIS
BOOK, WE HOPE
YOU WILL LEARN
NEW TERMS AND
VOCABULARY
WORDS.
VOCABULARY
WORDS WILL BE
UNDERLINED AND
CAN BE
REFERENCED IN
THE GLOSSARY.

BEFORE WE
BEGIN, WE NEED
TO ADDRESS
WHAT RADON IS
AND WHERE IT
COMES FROM...

RADON COMES FROM NATURALLY-OCCURRING CHEMICAL ELEMENTS THAT EXIST IN THE EARTH'S CRUST THAT WERE CREATED BILLIONS OF YEARS AGO WHEN THE EARTH WAS STILL FORMING.



THESE CHEMICAL ELEMENTS ARE RADIUM,
THORIUM, AND URANIUM.

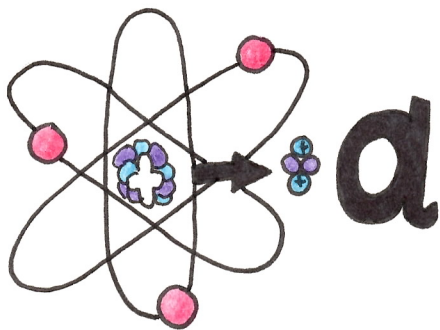
88 Ra Radium (226)	90 Th Thorium 232.0	92 U Uranium 238.029
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RADIUM, THORIUM, AND URANIUM CAN BE MINED AND CAN BE USED TO PRODUCE NUCLEAR ENERGY, CANCER TREATMENTS, AND NUCLEAR WEAPONS.

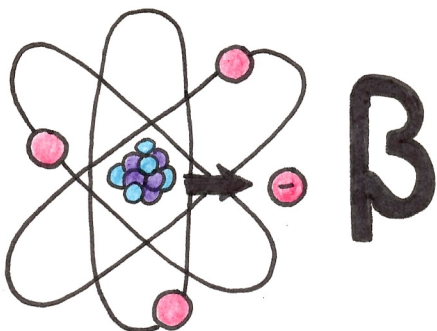
MINING CAN INCREASE THE PRESENCE OF RADON.

RADON IS MADE UP OF TINY RADIOACTIVE PARTICLES. THESE RADIOACTIVE PARTICLES PRODUCE DIFFERENT FORMS OF RADIATION SUCH AS...

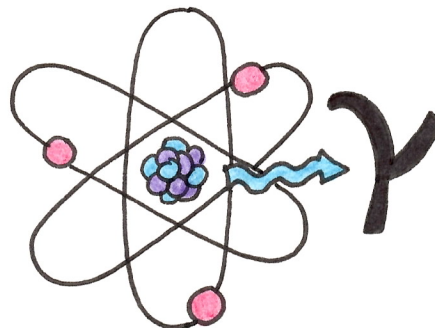
ALPHA RADIATION



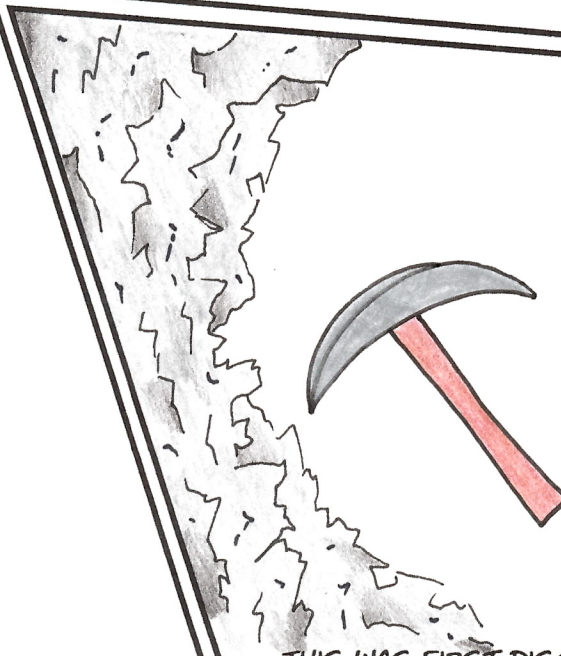
BETA RADIATION



GAMMA RADIATION



THIS RADIATION MAKES RADON GAS DANGEROUS TO HUMAN HEALTH.



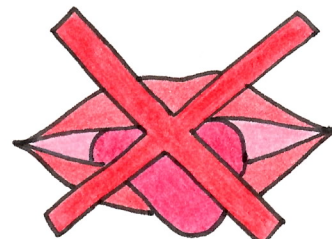
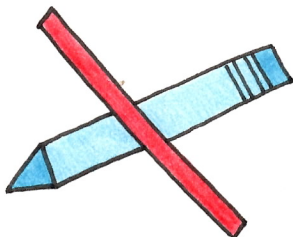
THIS WAS FIRST DISCOVERED IN THE 16TH CENTURY AMONGST URANIUM MINERS.

UNFORTUNATELY, RADON GAS IS...



ODORLESS...

COLORLESS...



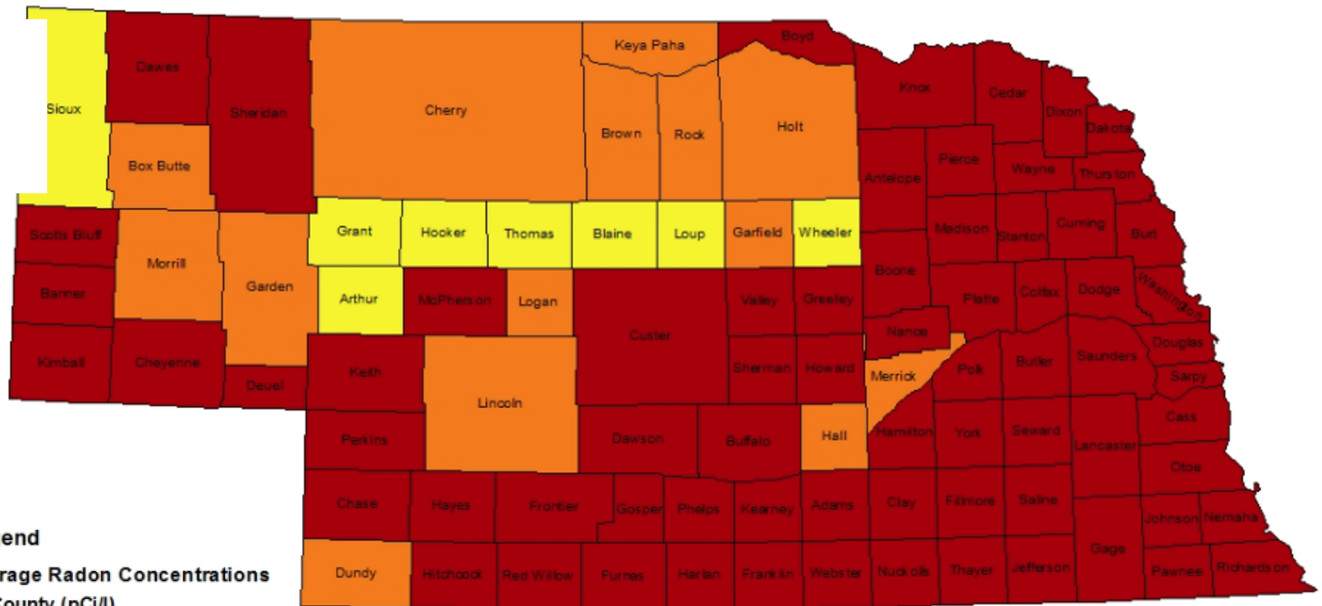
TASTELESS...

MAKING IT HARD TO KNOW WHEN IT IS AROUND YOU OR DETECT.

RADON IS A PUBLIC HEALTH CONCERN IN NEBRASKA.

Average Radon Concentrations by County

Nebraska Radon Program Data through 2013



Legend

Average Radon Concentrations by County (pCi/l)

- Zone 1 - ≥ 4.0 pCi/l
- Zone 2 - 2 pCi/l - 3.9 pCi/l
- Zone 3 - < 2 pCi/l

MORE THAN HALF OF NEBRASKAN HOMES TEST ABOVE THE REGULATORY LIMIT SET BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA).

THE EPA IS A FEDERAL GOVERNMENT AGENCY THAT REGULATES HOW MUCH A NATURAL OR MAN-MADE CHEMICAL CAN EXIST IN THE ENVIRONMENT.

EPA

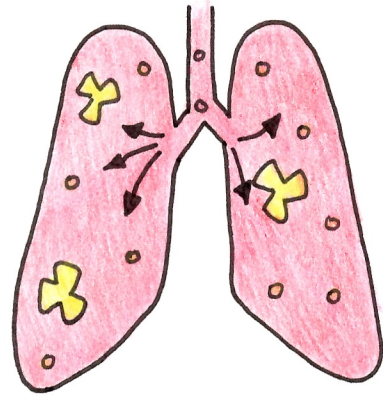
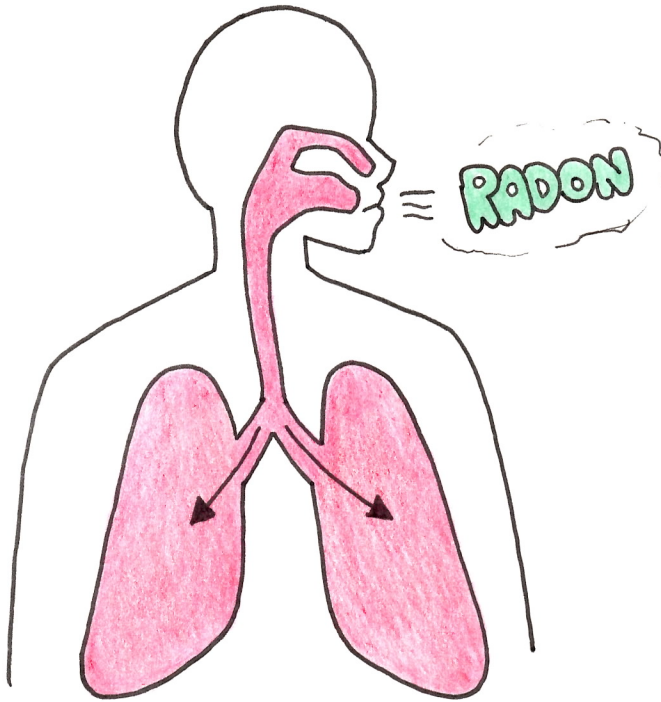
THEY DO THIS THROUGH SETTING REGULATORY LIMITS THAT ARE BASED ON HEALTH RESEARCH AND INDUSTRY INPUT, CREATING FINES, AND COLLECTING DATA THAT SHOWS HOW MUCH OF THESE CONTAMINANTS EXIST IN SOIL, WATER, FOOD, AND AIR.

THE REGULATORY LIMIT SET BY THE EPA FOR RADON IS 4 pCi/l SO IT IS RECOMMENDED THAT ALL LEVELS REMAIN BELOW THIS TO NOT IMPACT HUMAN HEALTH...



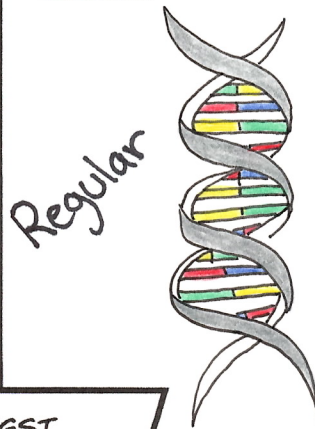
BUT THERE IS NO 'SAFE' LEVEL - LOWER IS BETTER

RADON GAS GETS INTO THE BODY BY BEING BREATHED INTO THE LUNGS...

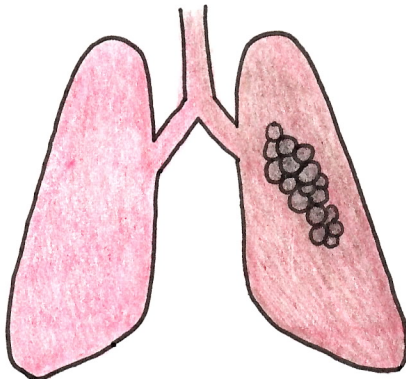


AND EMITTING ALPHA RADIATION DAMAGING DNA IN CELLS IN THE LUNGS IN THE RESPIRATORY SYSTEM.

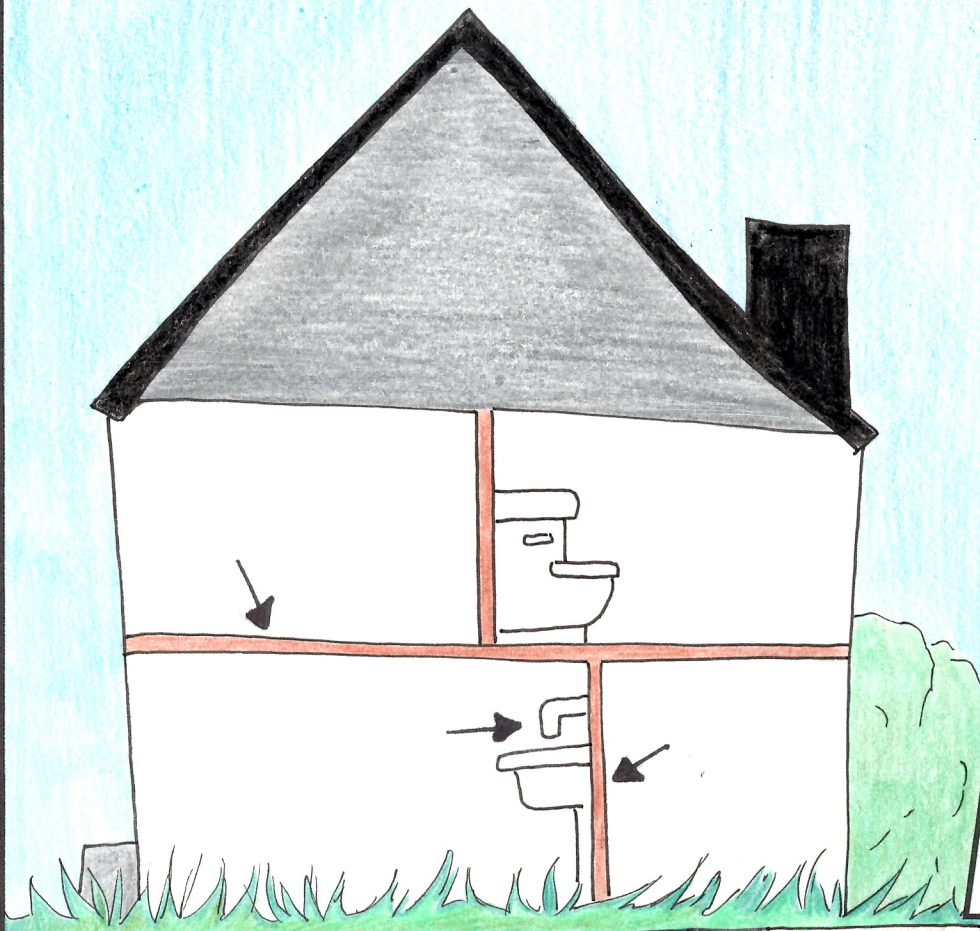
THIS DAMAGE CAN RESULT IN DNA MUTATIONS. DNA MUTATIONS CAN LEAD TO UNCHECKED CELL GROWTH THAT FORM TUMORS THAT CAN TURN INTO CANCER.



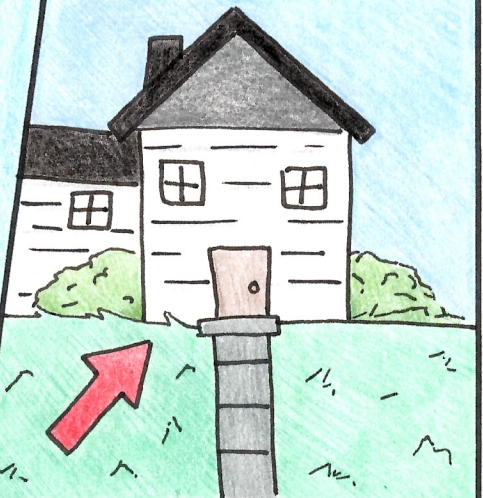
THIS MAKES RADON THE LEADING CAUSE OF LUNG CANCER AMONGST NON-SMOKERS AND SECOND CAUSE FOR SMOKERS.



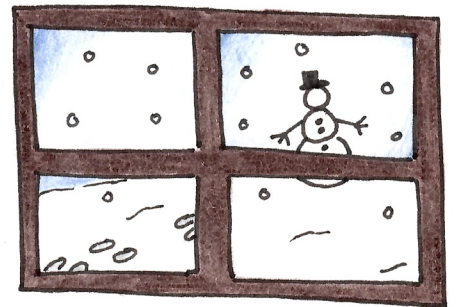
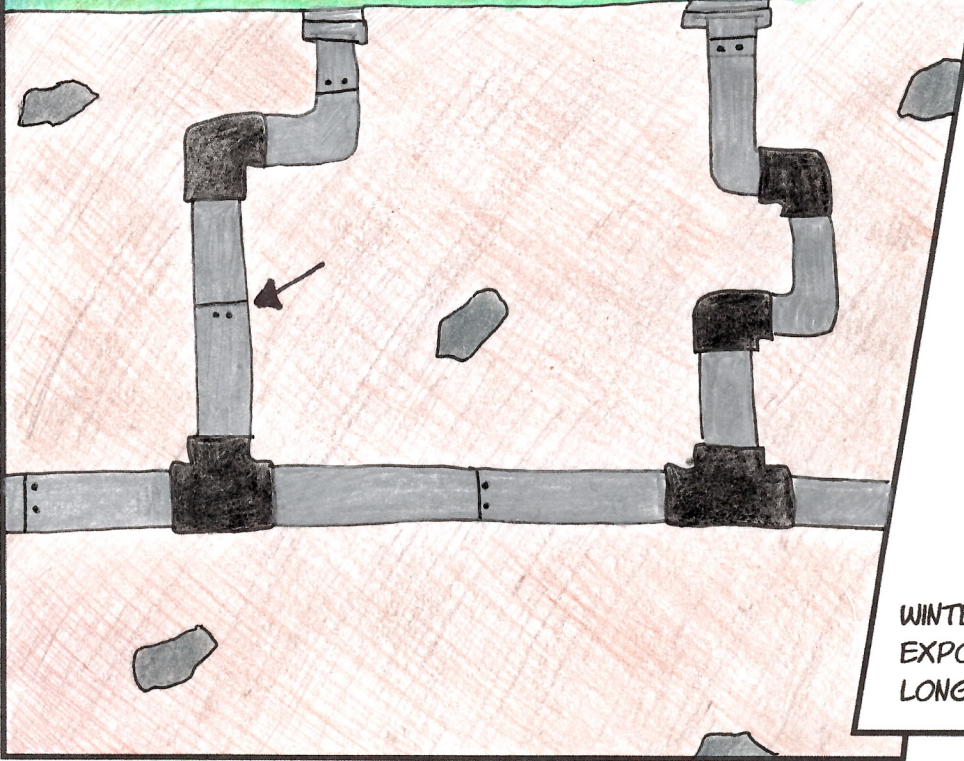
RADON GETS INTO HOMES THROUGH CRACKS IN FLOORS, WALLS, GAPS IN PIPES, AND THE WATER SUPPLY



CINDER BLOCKS, COMMONLY USED IN BASEMENTS, CAN HAVE RADON IN THEM.

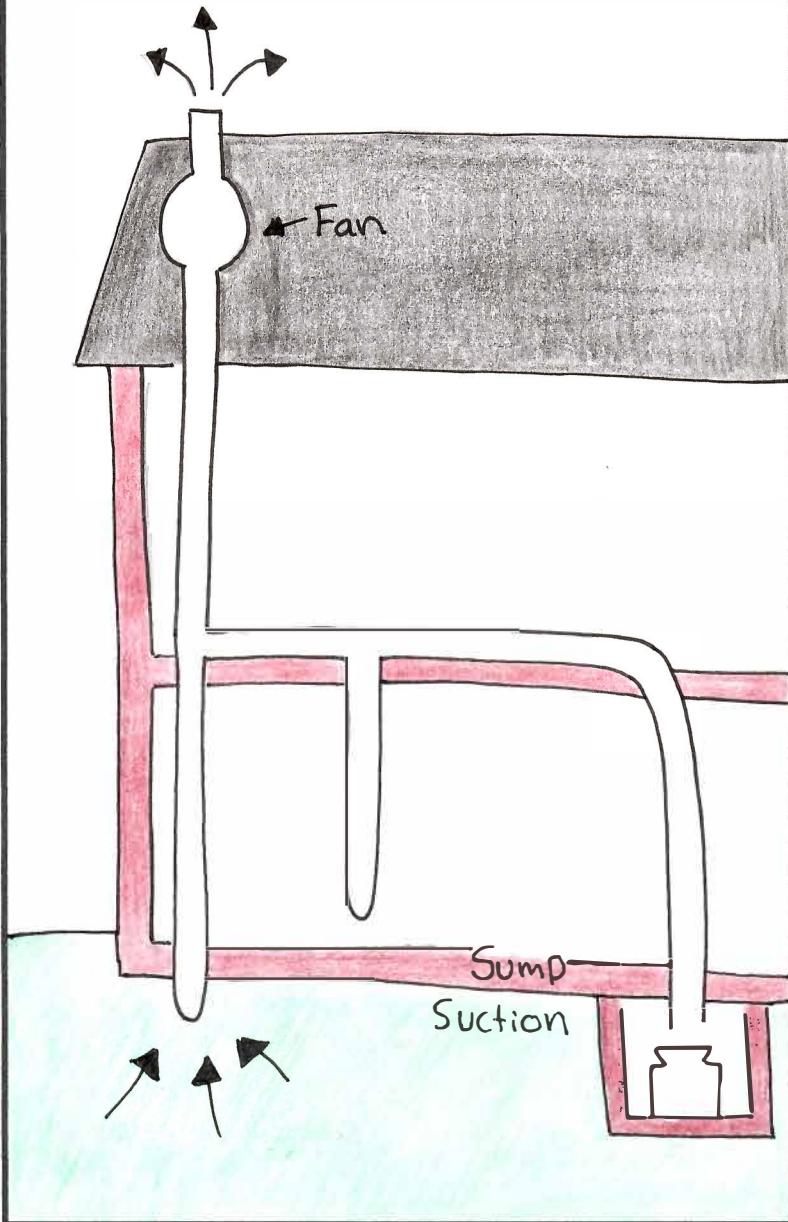


RADON GAS IS DENSER (OR HEAVIER) THAN AIR, SO IT CAN COLLECT IN THE LOWEST PART OF THE HOME SUCH AS THE BASEMENT.

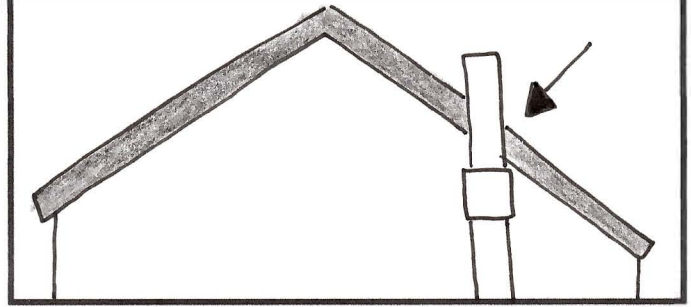


WINTERTIME CAN INCREASE RADON EXPOSURE BECAUSE OF THE COLD AIR AND LONGER AMOUNT OF TIME SPENT INSIDE.

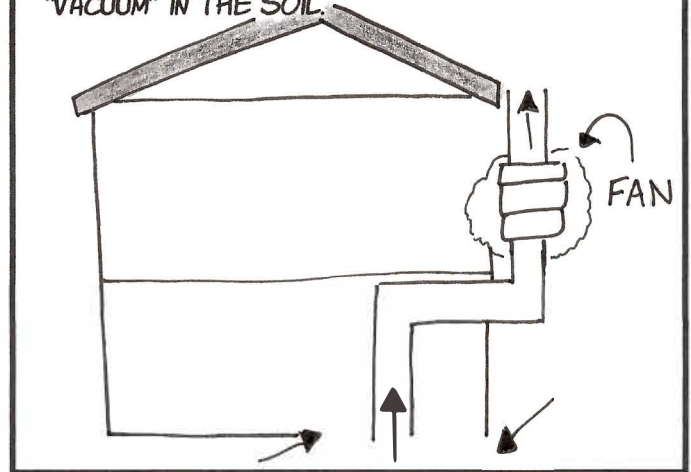
RADON LEVELS CAN BE REDUCED IN HOMES THROUGH MITIGATION. THERE ARE SPECIFIC SYSTEMS THAT CAN BE INSTALLED IN YOUR HOME CALLED ACTIVE SOIL DEPRESSURIZATION (ASD).



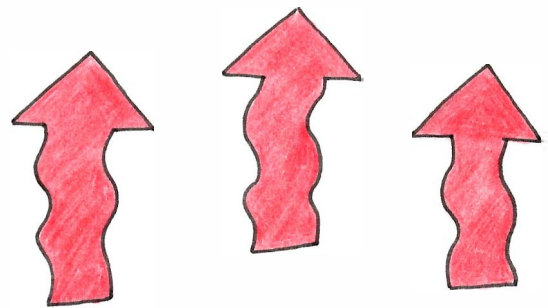
AN ASD SYSTEM CONSISTS OF A PLASTIC PIPE EXTENDING FROM THE SOIL TO A POINT ABOVE THE ROOF.



AN IN-LINE FAN IN THE ASD SYSTEM CREATES A "VACUUM" IN THE SOIL.



THIS DRAWS THE RADON INTO THE SYSTEM INSTEAD OF INTO YOUR HOUSE.



THROUGH REGULAR TESTING AND INSTALLING ASD SYSTEMS, WE CAN ENSURE THAT WE ALL HAVE HEALTHY HOMES THAT ARE FREE OF RADON AND THE RISK OF DEVELOPING CANCER.



Healthy
Homes

Glossary

Alpha radiation is made up of positively charged particles. It has the lowest level of energy.

Active Soil Depressurization (ASD) systems are Radon mitigation systems where a pipe is installed in the foundation floor slab of a home, through which a fan draws in radon from beneath the home, expelling it outdoors.

Beta radiation is made up of negatively charged particles. It has the next increasing level of energy.

Cancer is a group of more than 100 related diseases that begin in your body's cells.

Chemical Elements are pure substances that cannot be broken down further by ordinary chemical processes. These chemical elements can be found on the Periodic Table of Elements.

Detect is the action to measure or sample for something in the environment (i.e. home, work, or school).

DNA is the hereditary material in humans and almost all other organisms.

DNA mutations are permanent changes in the DNA sequence of a gene. Mutations range in their severity.

Environmental Protection Agency (EPA) is a federal agency that protects the environment through regulation and enforcement of regulation.

Gamma radiation is made up of particles that have no charge. It has the highest level of energy.

Lungs are a pair of breathing organs that are part of the respiratory system in the body. They are responsible for removing carbon dioxide from and bringing oxygen to the blood.

Mining is the process of extracting useful minerals from the surface of the Earth, including the seas.

Mitigation is the action of reducing the severity, seriousness, or existence of something in the environment.

Radiation is the emission or transmission of energy in the form of waves or particles through space or through a material medium. There are three types of radiation: alpha, beta, and gamma.

Radioactive particles are the particles resulting from radioactive decays.

Radium is the chemical element of atomic number 88, a rare radioactive metal of the alkaline earth series. It was formerly used as a source of radiation for radiotherapy.

Radon is a naturally-occurring colorless and odorless gas that is the decay product of Uranium, Thorium, and Radium.

Regulatory Limits are set by governmental agencies and based on scientific research regarding how much of a chemical can exist in our environment without causing excessive harm to our health.

Respiratory system is the set of organs, or system, that allows a person to breathe and exchange oxygen and carbon dioxide throughout the body.

Thorium is the chemical element of atomic number 90, a white radioactive metal of the actinide series. It is commonly used as a source of nuclear energy, as a coating on sun-lamp and vacuum-tube filament coatings, and in alloys.

Uranium is the chemical element of atomic number 92, a dense gray radioactive metal used as a fuel in nuclear reactors.

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