

# Uranium, Radium and Radon: Teacher Answer Key

Element	Symbol	Atomic Number	Atomic Mass	Atomic Structure	Group/Family and Properties
Uranium	U	92	238	Protons: 92 Electrons: 92 Neutrons: 330	Part of the actinide series; silvery white, weakly radioactive metal
Radium	Ra	88	226	Protons: 88 Electrons: 88 Neutrons: 138	Alkaline earth metal; naturally radioactive, silvery-white metal that blackens when exposed to air
Radon	Rn	86	222	Protons: 86 Electrons: 86 Neutrons: 136	Noble gas; colorless, odorless, and tasteless radioactive element

1. How are we exposed to these elements?

Natural (background) sources: **Uranium, radium and radon are naturally occurring radioactive elements found in soil, rock and water.**

Man-made sources: **Man-made activities, like digging and mining, can bring these elements to the surface. These elements may also be found in radioactive waste from human activities like mining, milling and nuclear power generation.**

2. What is the connection between the elements in the table above?

**Uranium decays to form radium and radon. Exposure to radon can cause lung cancer.**

3. Explain how the elements' atomic structures relate to their radioactive properties.

**An atom is unstable (radioactive) if the forces among the particles that make up the nucleus are unbalanced from an excess of either neutrons or protons. Unstable nuclides of any element can exist. However, almost all elements that are heavier than bismuth, which has 83 protons, have an unstable nucleus; they are radioactive and are known as "heavy nuclides."**

4. Why is exposure to these elements a concern?

**These elements tend to pose more of a concern when they exist in high concentrations (e.g., in radioactive waste) rather than in their natural state. Concentrations of these elements can contaminate the soil, water and air. People and animals may also be contaminated by or exposed to these elements. Exposure to these elements may pose health effects. For example, radon can cause lung cancer.**