

What is nuclear?

Nuclear physics is all about the nucleus of the atom. The nucleus can emit radiation; this radiation is called radioactivity. Radioactivity was first discovered in 1896 by the French scientist Henri Becquerel. It was found that the radiation was actually made of 3 different types of particle. Scientists didn't know what these 3 new particles were so they named them Alpha, Beta and Gamma. We now know that these 3 particles are not actually new at all, they are the nucleus of a Helium atom, an electron, and a high energy photon (particle of light).

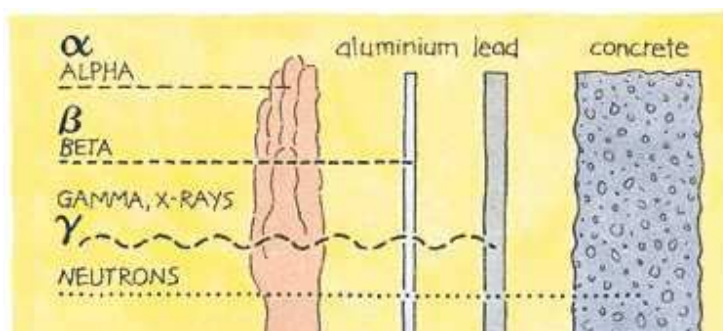
Radioactivity occurs when the nucleus of an atom disintegrates. It will disintegrate because it is unstable. It will become unstable because there are too many neutrons and protons.

Where is it used?

Nuclear physics is used in medicine, energy production, industrial applications, and even to make food safe to eat.

Is it dangerous?

The danger depends on the level of exposure (dose) and the type of radioactivity. Our environment is swamped in radioactivity; it has always been here with us. A certain level of exposure is perfectly safe. However, large exposures can be dangerous to your health.



What is Fission?

Name	
Real Particle	Helium nuclei
Charge	Positive
Speed	Slow
Mass	
Danger	Very dangerous if inhaled or ingested
Distance Traveled in Air	Few centimeters
Effective Barrier	Tissue Paper, Air
Where Found	Smoke alarms, Cigarettes, Water, Soil, Radon gas

Name	
Real Particle	Electron
Charge	
Speed	Fast
Mass	Small
Danger	Reasonably dangerous if inhaled or ingested
Distance Traveled in Air	About 30 cm
Effective Barrier	Aluminium Foil, Air
Where Found	Cancer treatments, Industrial instruments, Carbon dating

Name	
Real Particle	High Energy Photon (particle of light)
Charge	
Speed	Very fast
Mass	No mass
Danger	Very dangerous
Distance Traveled in Air	Several kilometers
Effective Barrier	Steel, Lead, Concrete
Where Found	Nuclear waste, Cancer treatments, Industrial instruments, Sterilizing medical equipment, Soil, Water, Bananas

1. Which type of radioactive particle can travel the furthest in air?
2. Do you think gamma radiation could pass through a house wall? Why?
3. Would it be safe to stand in the same room as a source of alpha radiation? Why?
4. Why should nuclear waste be disposed of responsibly?
5. Could beta radiation get through the wall of a concrete bunker?
6. Which type of radiation poses the most danger to everyday people?