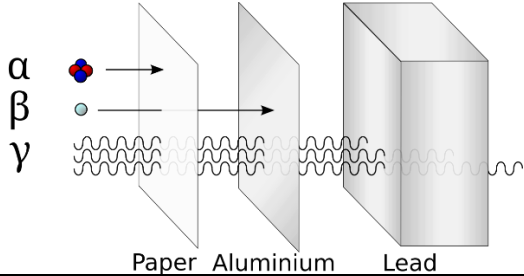
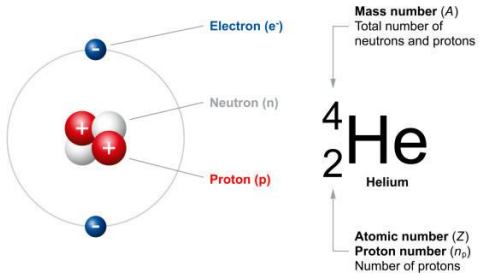
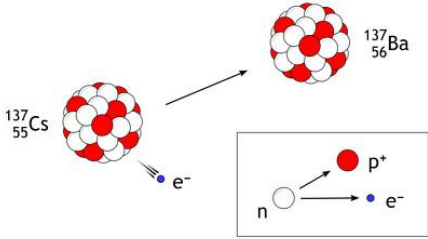
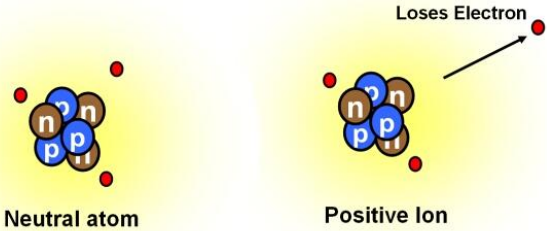
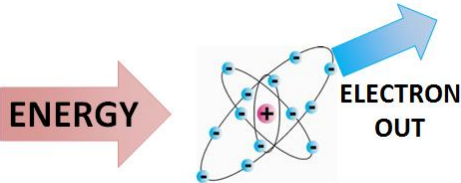


7b Radioactivity and Particles Year 9

Key word	Simple meaning	GCSE definition	Words in a sentence	Translation
Absorb (radiation)	Stop the radiation inside a material.	Absorption is when radiation is stopped by a material. Alpha is absorbed and stopped by 5cm of air or 1 sheet of paper. Beta is absorbed and stopped by 3mm of aluminium.	The paper absorbed all the alpha particles . 	
Alpha particle	Particle that come from a nucleus. Symbol α	2 protons and 2 neutrons ejected from a large nucleus when it decays.	The alpha particle came from the nucleus , so the nucleus lost 2 protons and 2 neutrons .	
Atom	An atom has protons, neutrons and electrons.	Protons and neutrons form a small nucleus with electrons in electron shells.	A stable atom has a nucleus that doesn't decay .	
Atomic number (proton number)	Number of protons in a nucleus.	The number of protons in a nucleus. 	The atomic number of 79 means that there are 79 protons in the nucleus of that atom .	
Balanced nuclear equation	An equation to show the mass and charge of nuclei.	An equation that shows how total mass before and mass after is the same, total charge before and charge after is the same. Alpha (α) Radiation ${}_{92}^{238}\text{U} \longrightarrow {}_{90}^{234}\text{Th} + {}_2^4\text{He}$	The mass number is the number on top in a balanced nuclear equation .	
Beta particle	Particle that comes from a nucleus. Symbol β	Fast moving electron that is ejected from the nucleus when it decays.	Beta particles are fast moving electrons. Beta particles come from the nucleus. Beta particles have -1 relative charge.	

				
Electron	Particle with negative charge.	Fundamental particle with negative charge. They are in electron shells. They are not in the nucleus of the atom.	Electrons have -1 relative charge. Electrons are found in electron shells. Electrons have less mass than protons.	
Gamma ray	Light ray that comes from a nucleus.	High energy light (electromagnetic radiation) that is emitted from a nucleus when it decays.	The gamma rays have no charge and no mass , so they are not very ionising. Gamma rays are high energy light .	
Ion	An atom with a different number of protons and electrons	An atom with a different number of protons and electrons . E.g. if there are 4 protons in the nucleus and 3 electrons around it, it is an ion .	The atom became an ion when it lost an electron . 	
Ionising radiation	Something that can remove an electron from an atom . 	Radiation that can remove an electron from an atom. Alpha particles, beta particles and gamma rays are all examples of ionising radiation .	The alpha particles ionised the air as they travelled. Alpha particles are very ionising . Unstable nuclei emit ionising radiation when they decay .	
Isotope	An atom with the same number of protons but a different number of neutrons in the nucleus.	An atom with the same number of protons but a different number of neutrons in the nucleus. Isotopes of the same element have the same number of protons .	Carbon-14 and Carbon-12 are two isotopes of carbon. They both have 6 protons in the nucleus .	

			<p>Carbon-12: 6 protons, 6 neutrons, 6 electrons Carbon-13: 6 protons, 7 neutrons, 6 electrons Carbon-14: 6 protons, 8 neutrons, 6 electrons</p>	
Mass number (nucleon number)	Mass of the nucleus	The total number of nucleons (protons and neutrons) in the nucleus .	Carbon-14 has 6 protons and 8 neutrons , its mass number is 14.	
Neutron	A particle with no charge.	A particle found in the nucleus with the same mass as a proton but with no charge .	<p>Neutrons are in the nucleus of an atom. They give the nucleus more mass but don't change the charge.</p> <p>Neutrons are hard to detect because they have no charge.</p>	
Nucleus	Middle of an atom.	<p>The nucleus is small and dense, made up of protons and neutrons. The nucleus is in the middle of the atom.</p>	<p>The protons and neutrons are in the nucleus of the atom.</p> <p>The nucleus of an atom is small and dense.</p>	
Penetrating power	How easy it is to go through.	<p>The penetrating power of ionising radiation is how much it can go through a material. Alpha particles are the least penetrating. Beta particles are moderately penetrating. Gamma rays are the most penetrating.</p>	<p>Alpha particles can only travel 4cm in air, they are not very penetrating.</p> <p>If radiation is very ionising, the penetration power is low.</p> <p>Gamma rays are not very ionising, they have a large penetration power.</p>	
Proton	A particle with positive charge.	A particle found in the nucleus with the same mass as a neutron but with positive charge . Protons have +1 relative charge .	The protons in the nucleus have positive charge .	

