

GCSE RADIOACTIVE DECAY

Unstable nuclei emit energy in the form of particles or electromagnetic radiation to become more stable. This is radioactive decay.

- Name the three most common types of radiation, and their symbols, that can be released when a nucleus decays.
- Write down i) what an alpha particle is made of and ii) what a beta particle is made from.

i) _____ ii) _____

- Fill in the table.

Type of radiation	Alpha (α)		Gamma (γ)
Charge		-1	neutral
Relative mass	4		
Object that stops the radiation			
Does the radiation change the element?			

- Define the atomic number of an element and write down its symbol.
- Define the mass number of an element and write down its symbol.
- Write down what happens to an element's atomic number if it undergoes i) alpha emission, ii) beta emission and iii) gamma emission.

i) _____ ii) _____ iii) _____
- Write down what happens to an element's mass number if it undergoes i) alpha emission, ii) beta emission and iii) gamma emission.

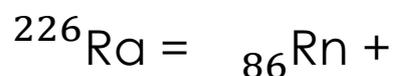
i) _____ ii) _____ iii) _____
- Describe the process that allows beta decay to take place. Think about how a negatively charged particle can be emitted from a nucleus that only contains positive and neutral particles (protons and neutrons).



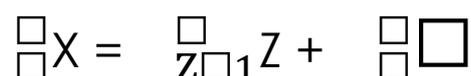
9. Fill in the boxes to complete the general nuclear equation describing alpha emission for an element, X, decaying into element Y.



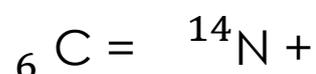
10. Complete the nuclear equation for radon undergoing alpha decay.



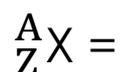
11. Fill in the boxes to complete the general nuclear equation describing beta emission for an element, X, decaying into element Z.



12. Complete the nuclear equation for carbon undergoing beta decay.



13. Write down the general nuclear equation for an element, X, undergoing gamma decay.



14. Write down the nuclear equation for cobalt-60 undergoing gamma decay. Cobalt has an atomic number, $Z = 27$.

15. Write down if the following decays are possible and if they are, name the process of decay (you may need a periodic table to help you).

- Thorium-232 can decay to radium-228
- Carbon-14 can decay into oxygen-14
- Uranium-238 can decay to thorium-232
- Technetium-99 can decay into technetium-99
- Lithium-8 can decay into beryllium-8

