UNIT 6 - RADIOACTIVITY AND NUCLEAR CHEMISTRY

6.1B HOMEWORK - PROPERTIES OF RADIATION AND RADIOACTIVE ISOTOPES

1. Complete the following table by stating what effect the following barriers will have on each type of radiation; answer either "no effect", "will reduce intensity" or "will completely stop"

Barrier	α-particles	β-particles	γ-rays
10 cm of air	will stop	no effect	no effect
a thin sheet of paper	will stop	will reduce intensity	no effect
a thin sheet of aluminium	will stop	will stop	no effect
a thick layer of lead	will stop	will stop	will reduce intensity

2. Dangers of radiation

(a)	State the two ways in which radiation can be harmful	It kills living cells It can also make them cancerous
(b)	Explain why gamma radiation is generally considered more dangerous than alpha or beta radiation	Because it can penetrate skin and travel much longer distances
(c)	In what circumstances would alpha or beta radiation be considered very dangerous?	If it is Inhaled, ingested or injected

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3. Half-life calculations

3.	The half-life of carbon-14 is 5730 years.	
	(a)	If a fossil is approximately 23,000 years old, approximately what percentage of its carbon-14 should still be present?
		23,000/5730 = 4 half-lives 4 half-lives means 6.25% left
	(b)	A skeleton was discovered in a pyramid. It's carbon-14 content was 25% of the carbon-14 found in living tissue. How old is the skeleton?
		25% = two half lives 5730 x 2 = 11460 years