Name _____ Period _____
College Prep Chemistry of the Earth

Assignment 1Q – Nuclear Decay Rate   20 Points
Answer the following questions based on the in class notes

What is nuclear decay rate?	What determines the nuclear decay rate (*half-life*) of an isotope?
Define an isotopes "*half-life*"	Why does the number of particles that decay per half-life decrease over time?

Calculate the number of particles remaining after a number of half-lives have passed

Isotope	Starting Particles (N^o)	Number HL passed (n)	Remaining Particles (N_t)	Number HL passed (n)	Remaining Particles (N_t)
^{221}Fr	50000	2	25000 → (12500) ÷2 (Twice)	6	6250 →3125 →1563→ (781) ÷2 (six times)
^{14}C	4000	1		3	
^{211}Po	150000	3		5	
^{38}Cl	8000	2		4	

Calculate the number of particles remaining after a number of half-lives have passed

Isotope	Starting Particles (N^o)	HL Time	Total Time	# HL Passed	Remaining Particles (N_t)
^{220}Rn	(40000)	345yr	1725yr	5	1250 ÷2 (Five X)
^{221}Br	25000	35.6min	142.4min	$\frac{Total\ Time}{HL\ Time}$ $\frac{1725yr}{345yr}=5$	
^{131}I	100000	8.1days	40.5days		
^{99}Mo	60000	67hours	536hours		