

Key Terms		
1	Atom	The smallest part of a substance that can exist
2	nucleus	Positive central mass of an atom
3	Proton	Positive subatomic particle in nucleus
4	Neutron	Neutral subatomic particle in nucleus
5	Electron	Negative subatomic particle which orbits the nucleus
6	Atomic number	The number of protons in an atom of an element
7	Mass number	The number of protons and neutrons in an atom of an element
8	Energy level	Shells in which electrons orbit the nucleus
9	ion	charged particle that has lost or gained electron(s)
10	isotope	element with the same number of protons but different number of neutrons
11	radioactive	Substance which emits ionizing radiation or particles

Radioactivity				
12	Radioactive decay	unstable nuclei emitting a type of radiation (α , β , γ or neutron)		
13	Becquerel (Bq)	1 Bq is one decay per second.		
14	random	cannot predict when or which nucleus will decay		
15	Geiger counter	Detects and counts number of radioactive decays		
16	Activity	Release of ionizing radiation or particles due to the random decay of unstable nuclei		
17	Half-life	time it takes for the number of nuclei of the isotope in a sample to halve		
18	Penetration	The distance radioactive particles can travel through a substance		
19	Alpha	α	${}^4_2\text{He}$	2 neutrons
				2 protons
20	Beta	β	${}^0_{-1}e$	1 electron
				Weakly ionising
21	gamma	γ	${}^0_0\gamma$	EM wave
				Low ionising

Discovery of the Atom		
22	John Dalton	First described atoms as solid spheres
23	JJ Thomson	Discovered electrons within atoms
24	Plum pudding model	Atom is ball of positive charge with electrons scattered within it
25	Ernest Rutherford	Discovered the positive nucleus at the centre of the atom
26	Alpha scattering experiment	Alpha particles fired at a sheet of gold foil. Some particles were deflected or reflected by the nucleus
27	Niels Bohr	theorised electrons in shells orbiting the nucleus
28	James Chadwick	Discovered the neutron in the nucleus
29	Size of atom	$1 \times 10^{-10} \text{ m}$ (0.1nm)
30	Size of nucleus	$1 \times 10^{-14} \text{ m}$

Nuclear equations		
31	Alpha decay	atomic number decreases by 2, mass number decreases by 4
32	Alpha equation	${}^A_Z\text{X} \rightarrow {}^{A-4}_{Z-2}\text{Y} + {}^4_2\alpha$
33	Beta decay	Neutron turns into proton and releases 1 electron. Atomic number increase by 1, mass number the same.
34	Beta equation	${}^A_Z\text{X} \rightarrow {}^{A}_{Z+1}\text{Y} + {}^0_{-1}\beta$
35	Gamma decay	no change to the nucleus when gamma radiation emitted. It is the nucleus getting rid of excess energy.

Irradiation and contamination		
36	Irradiation	Process by which an object is exposed to radiation
37	Contamination	presence of radioactive substances on surfaces or within substances (including the human body)
38	Exposure	Placing an object in the pathway of ionizing radiation.
39	Uses of irradiation	Use ionising radiation to kill pathogens in food and sterilise equipment.
40	Cancer	Uncontrolled cell division; can be caused by exposure to ionising radiation.