Nuclear #1

A: *Particles within the nucleus i.e. protons and neutrons*

Nuclear #2

A: *The strong force*

Nuclear #3

A: *Nuclei of the same element (i.e. same number of protons) with different masses (i.e. different number of neutrons)*

Nuclear #4

A: U_{92}^{235}

Mass number: *235*
Atomic number: *92*

Nuclear #5

A: Au_{79}^{197}

197 – 79 = 118 neutrons

Nuclear #6

A: *A becquerel is a unit to measure radioactivity, where 1 Bq = 1 decay per second.*

Nuclear #7

A: *Match the following…*

A) Alpha decay	Nucleus too big
B) Beta minus decay	Too many neutrons
C) Beta plus decay	Too many protons
D) Gamma Decay	Nucleus in excited state

Nuclear #8

A: *A neutrino is formed when a positron is formed.*

Nuclear #9

A:

It is heavier in a helium nucleus (the closer you get to iron(26 protons), the lighter the nucleons.

Nuclear #10

A: *Iron-56 (26 protons, 30 neutrons)*

Nuclear #11

A:

A positron and a neutrino.

Nuclear #12

A:

An electron and an anti-neutrino

Nuclear #13

A:

A helium nucleus – two protons and two neutrons

Nuclear #14

A:

Fusion is where things are joined together and fission is where things are split apart

Nuclear #15

A: *Total annihilation (no more mass)*

They are converted into raw energy in the form of EM waves (two identical photons that move in opposite directions)

Nuclear #16

A:

Up/Down
Top/Bottom
Charm/Strange

Nuclear #17	Nuclear #18
A: *Uranium with a higher percentage of U-235 (needed for induced fission).*	**A:** *When nuclear fission occurs, mass is lost and converted to energy.*

Nuclear #19	Nuclear #20
A: $U_{92}^{238} \longrightarrow Th_{90}^{234} + \alpha_2^4 + \gamma$	**A:** $O_8^{15} \longrightarrow N_7^{15} + \beta_1^0 + \nu_0^0 + \gamma$

Nuclear #21	Nuclear #22
A: $C_6^{14} \longrightarrow N_7^{14} + \beta_{-1}^0 + \overline{\nu}_0^0 + \gamma$	**A:** $U_{92}^{235} + n_0^1 \longrightarrow X_{56}^{152} + Y_{36}^{80} + 4n_0^1 + \gamma$

Nuclear #23	Nuclear #24
A: *8 hours is 2 half-lives.* *So activity halves twice.* *i.e. activity = 90 / 2 / 2 = 22.5 Bq*	**A:** *600 / 2 / 2 / 2 = 75 Bq* *So 3 half-lives needed.* *9 hours / 3 = 3 hours.* *i.e. half-life is 3 hours*