(1) nucleon → a particle like proton or neutron
nuclide → ~~the ratio~~ an atom identified by protons and neutrons (specific isotope)

(2) The ratio starts at a 1:1 ratio, then increases to a 1:1.5 ratio as the atomic number increases.
* This is because of larger of protons, which creates an unstable nucleus.

(3) (1) α = alpha particle
mass # = 4
Atomic # = 2
Low energy with a positive charge
$\boxed{{}_{2}^{4}He}$ ← equal to a Helium nucleus with no e^-
A larger particle that can be easily be blocked with paper or clothing.

(2) β = beta particle
mass # = 0
Atomic # = 0
medium to high energy, negative charge
${}_{-1}^{0}\beta^{-1}$ ← equal to an electron
A small particle than can be blocked by any layer of metal or insulation.

(3) γ = gamma particle
mass # = 0
Atomic # = 0
very high energy, no charge
γ is the symbol
Pure energy, with a great ability to penetrate anything. Use thick layers of lead to block these particles.

(4) Radioactive means to have an unstable nucleus. This can result from an improper ratio of protons to neutrons.