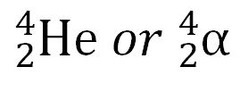
**Radioactive Isotopes**

1. Have too many or too few neutrons
2. Nucleus attempts to attain a lower energy state by releasing extra energy as radiation.
   1. Common forms of radiation include
      1. Alpha
      2. Gamma
      3. Beta
3. Half-life - the time needed for 1/2 of a radioactive sample to decay into stable matter
   1. The stable matter may have a higher or lower atomic number
   2. Useful in dating objects
   3. **Example**: Say that a 120g sample of C-14 is found today. How much will be remaining after 22,920?
4. Writing Radiation equations



1. The Nuclear Symbols for the different types of radiation are:
   1. Alpha – helium nucleus – radiation can be stopped by sheet of paper
      1. 
   2. Beta – neutron becomes proton – radiation can be stopped by aluminum plate
      1. 
   3. Gamma – consists of photons – absorbed by dense materials but goes through most items
      1. 
2. When writing the equation, start with the radioactive isotope on the left followed by a yield sign. The right side of the equation will consist of the radiation and the more stable isotope.
   1. Example 1: Thorium-232 decays by emitting an alpha and a gamma.
   2. Example 2: Uranium-239 decays by emitting a beta and a gamma.