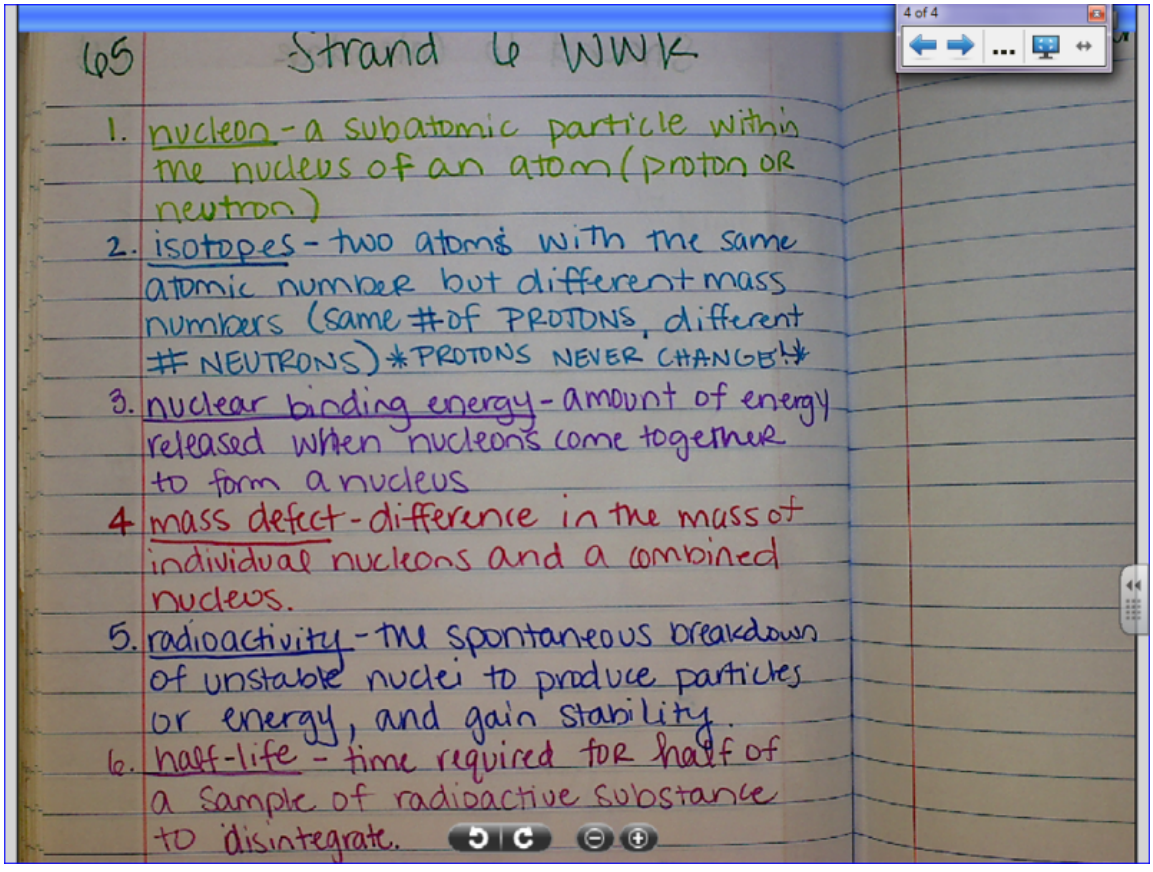
In a google doc, share with me 3 New Year's resolutions you have. One must be academic, and the other two can be personal or academic.

My three are:

1. Have more patience with my children (home) and students(school).
2. Run at least one mile every day this year and end the year with 1000 run miles.
3. Grow in faith to God and use my faith to be a better wife and mother.

Jan 6-3:43 PM



65 Strand 6 WWK

1. nucleon - a subatomic particle within the nucleus of an atom (proton or neutron)
2. isotopes - two atoms with the same atomic number but different mass numbers (same # of PROTONS, different # NEUTRONS) *PROTONS NEVER CHANGE!!*
3. nuclear binding energy - amount of energy released when nucleons come together to form a nucleus
4. mass defect - difference in the mass of individual nucleons and a combined nucleus.
5. radioactivity - the spontaneous breakdown of unstable nuclei to produce particles or energy, and gain stability.
6. half-life - time required for half of a sample of radioactive substance to disintegrate.

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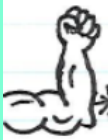
Inside the Nucleus TOC Pg 67-68

3 subatomic particles:



* Inside the nucleus the _____ and _____ are held together by a _____.
  → later, it was found that these nucleons are actually composed of even smaller particles called _____

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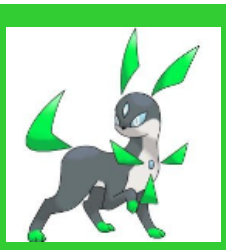

REVIEW:

atomic mass = protons + neutrons → 12

atomic # = # protons → 6 C

A - atomic # = P - protons = E - electron *neutral state

M - mass = A - atomic # + N - neutrons =

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mass defect & Binding Energy

proton = 1.00728amu neutron = 1.00867amu

mass of nucleons = atomic mass

$^{12}_{6}C$

EX: find the mass defect of Carbon:

6 protons = 6 x 1.00728amu = 6.04368amu

6 neutrons = 6 x 1.00867amu = 6.05202 amu

6.04368 + 6.05202 = 12.09570

12.09570 − 12.011 = 0.0847amu

① convert the mass defect to kg: 1amu = 1.6605×10^{-27} kg

$0.0847\text{amu} \cdot 1.6605 \times 10^{-27}\text{kg}$

$1.406 \cdot 10^{-28}\text{kg}$

② Plug in to $E = mc^2$

m = mass defect in kg

c = speed of Light 3.00×10^{8} m/s

$E = (1.406 \cdot 10^{-28}\text{kg}) \times (3.00 \cdot 10^{8}\text{m/s})^2$

$E = 1.2654 \cdot 10^{-11}$ J

$\text{kg} \cdot \text{m/s}^2 = \text{J}$

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The mass of the tritium isotope $^{3}_{1}H$ is 3.0160490amu. Find the binding E.

① mass defect

nucleons: 1(p) 2(n)

1.00728amu + 2(1.00867amu) = 3.02462

atomic mass: 3.0160490amu

3.02462 − 3.0160490 = 0.008571amu

② amu → kg

$0.008571 \cdot 1.6605 \cdot 10^{-27}\text{kg}$

$1.4232 \cdot 10^{-29}\text{kg}$

③ $E = mc^2$

$E = (1.4232 \cdot 10^{-29}\text{kg})(9.00 \cdot 10^{16}\text{m}^2/\text{s}^2)$

$E = 1.2809 \cdot 10^{-12}$ J

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