

Conservation Of Mass and Energy - \_\_\_\_\_

or \_\_\_\_\_ but can be \_\_\_\_\_ into \_\_\_\_\_ according to the formula

$$\frac{\text{Units( )}}{\text{Units( )}} = \frac{\text{Units( )}}{\text{Units( )}}$$

c - speed of \_\_\_\_\_

**Mass (kg) to Energy (J) Equation**

\*\* \_\_\_\_\_ that can be obtained from \_\_\_\_\_

Since 1 AMU = \_\_\_\_\_ Kg - Plug into equation ...

$$E = mc^2$$

$$E = (\text{_____ Kg}) \times (\text{_____})^2$$

$$= \text{_____ Mev or _____ MeV}$$

\*\*\*\*\*

$$\boxed{1 \text{ AMU converts to _____ Mev or _____}}$$

**MeV**

\_\_\_\_\_ (Mass/Energy Relationship)

Typical Regents Question - How much energy can be generated when 2 amu are completely converted into energy?

**Answer:** \_\_\_\_\_ (each \_\_\_\_\_)

Forces inside nucleus

1) \_\_\_\_\_ - holds nucleus together

- \_\_\_\_\_

- operates at distance  $< 10^{-13}$  meters

A) Binding Energy- amount of energy needed to separate nucleons in nucleus.

Protons and neutrons in nucleus \_\_\_\_\_

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Mass of Assembled Nucleus < Combined mass of an equivalent # of nucleons.

Lost mass called **mass defect** - \*\*Mass Defect = binding energy \*\*  
(mass lost is converted to energy)

Subatomic Particles - \_\_\_\_\_  
See reference table – Classification of matter

Examples:

- Neutrino – no charge and less mass than electron!! (Travel close to speed of light!!!!)

*Sun produces so many neutrinos that \_\_\_\_\_  
neutrinos pass through every square centimeter (0.15 sq  
in) of the surface of Earth every second.*

- Meson – mass somewhere between an electron and proton
- Baryons relatively larger subatomic particles

ex) \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ (mass greater than neutron)

Baryons are made of smaller particles called **quarks (see ref.)**

Each subatomic \_\_\_\_\_ has an “\_\_\_\_\_”  
(\_\_\_\_\_)

The “antiparticle” of an \_\_\_\_\_ is called a \_\_\_\_\_