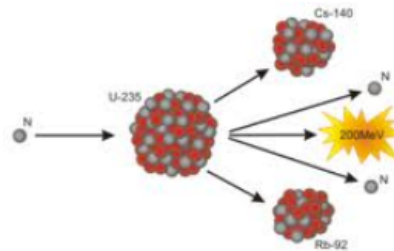
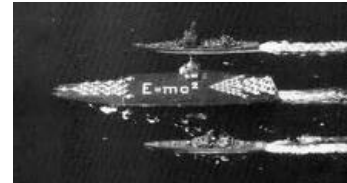
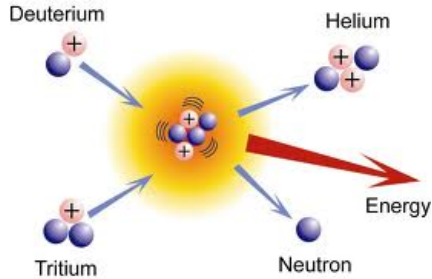


$E = mc^2$

perhaps the most famous equation of all, but what does it mean?



Apr 20-11:37 AM

MASS-ENERGY EQUIVALENCE

$$\begin{aligned}
 m_p &= 1.67 \times 10^{-27} \text{ kg} \quad \times 2 \\
 m_n &= 1.67 \times 10^{-27} \text{ kg} \quad \times 2 \\
 m_x &= 6.64 \times 10^{-27} \text{ kg} \quad \left| \begin{array}{l} 6.68 \times 10^{-27} \text{ kg} \end{array} \right.
 \end{aligned}$$

HUH? WHAT HAPPENED TO THE $0.04 \times 10^{-27} \text{ kg}$?

MASS IS NOT CONSERVED!

THE "MISSING MASS" BECOMES ENERGY

THIS IS AN EXAMPLE OF A FUSION REACTION

↳ PUTTING THINGS*
TOGETHER

* NUCLEI

Apr 20-12:09 PM

LET'S DO THE MATH

$$\Delta m = 0.04 \times 10^{-27} \text{ kg}$$

$$E = ?$$

$$E = (\Delta m) c^2$$

$$= (0.04 \times 10^{-27} \text{ kg}) (3 \times 10^8 \text{ m/s})^2$$

$$E = 3.6 \times 10^{-12} \text{ J}$$

CONVERT TO eV

$$= 2.25 \times 10^7 \text{ eV}$$

$$= 22.5 \text{ MeV}$$

A-BOMB: FISSION

H-BOMB: FUSION

Apr 20-12:21 PM

VOCAB

BINDING ENERGY
- "MISSING MASS"

Apr 20-12:33 PM