21.40 $A_t = 38$ $A_0 = 58.2$ $t_{1/2} = 5715$ yr

How old is it? Find t.

$\ln A_t = -kt + \ln A_0$

$\ln 38 = -(1.21 \times 10^{-4})t + \ln 58.2$

$t_{1/2} = \frac{0.693}{k}$

$k = \frac{0.693}{t_{1/2}}$

Apr 11-7:28 AM

$\frac{0.257\text{ mg } ^{206}Pb}{1\text{ mg } ^{238}U}$

$t_{1/2} = 4.5 \times 10^9$ yr

How old is the rock?

$\ln A_t = -kt + \ln A_0$

$\ln(1) = -(1.54 \times 10^{-10})t + \ln 1.297$

$k = \frac{0.693}{4.5 \times 10^9} = 1.54 \times 10^{-10}\ \text{yr}^{-1}$

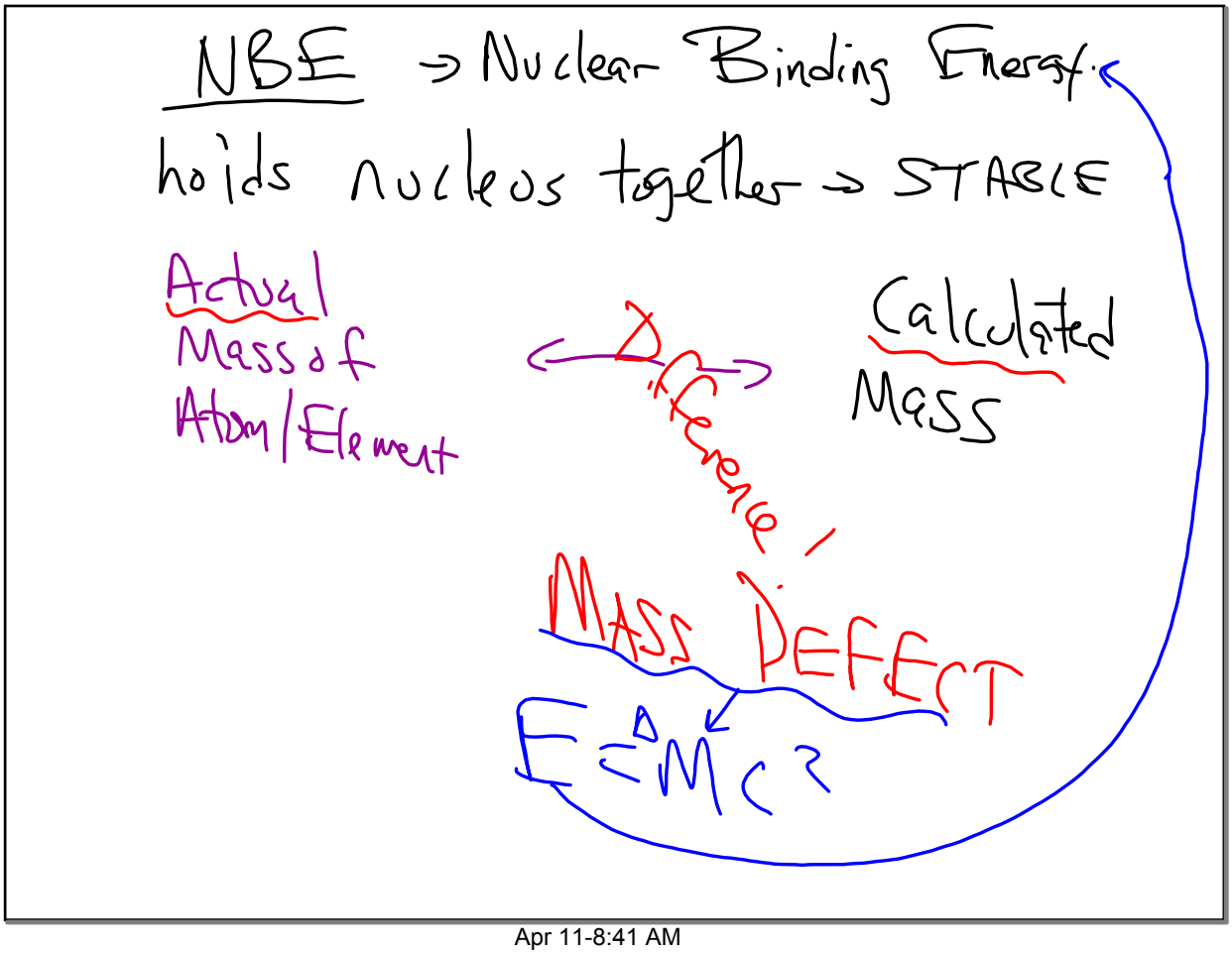
$U_{start} = U_{now} + U \to Pb$

$U_{start} = 1\text{ mg} + \left(\frac{238U}{206Pb}\right) 0.257\text{ mg Pb}$

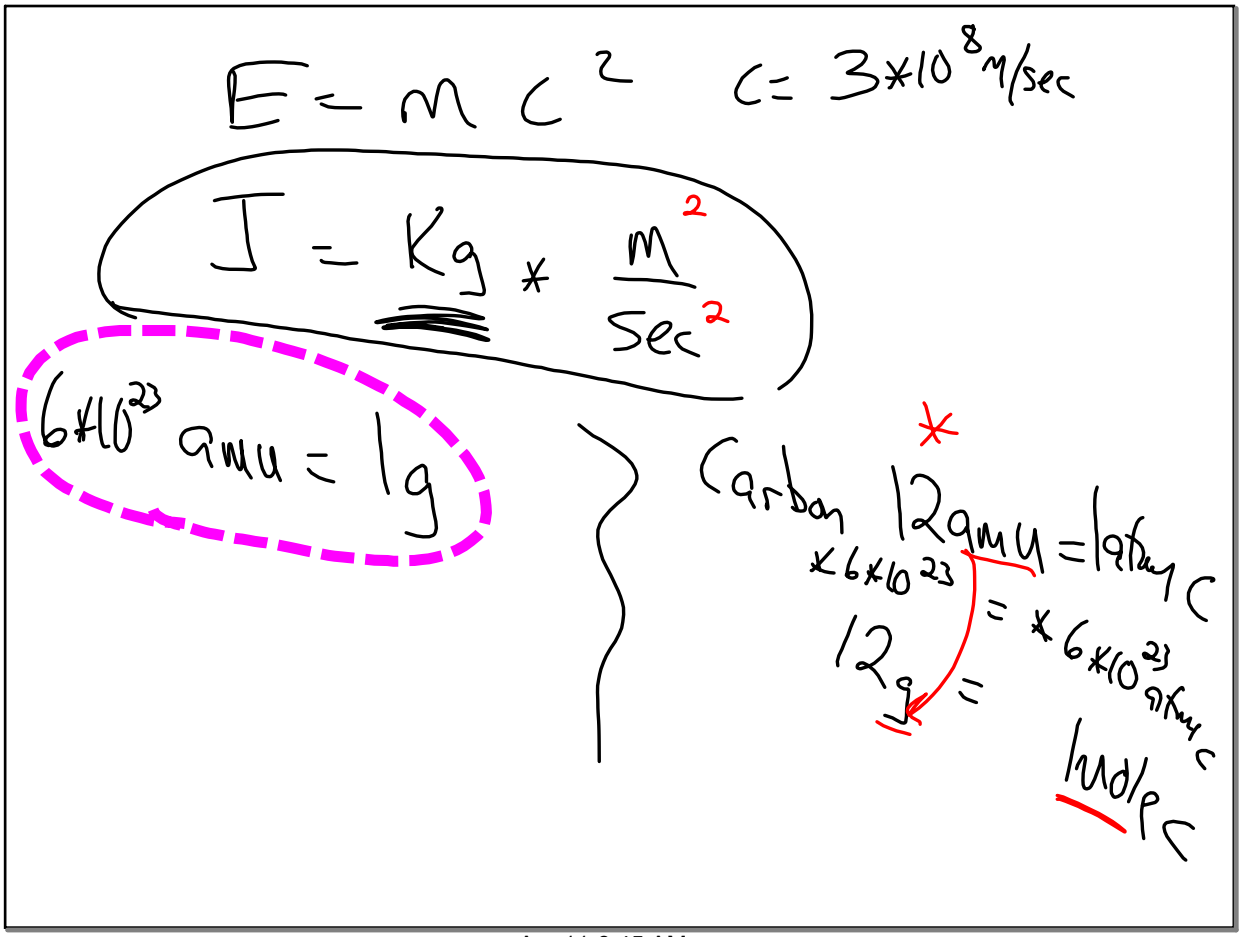
$= 1\text{ mg} + 0.297\text{ mg}$

$= 1.297\text{ mg U start}$

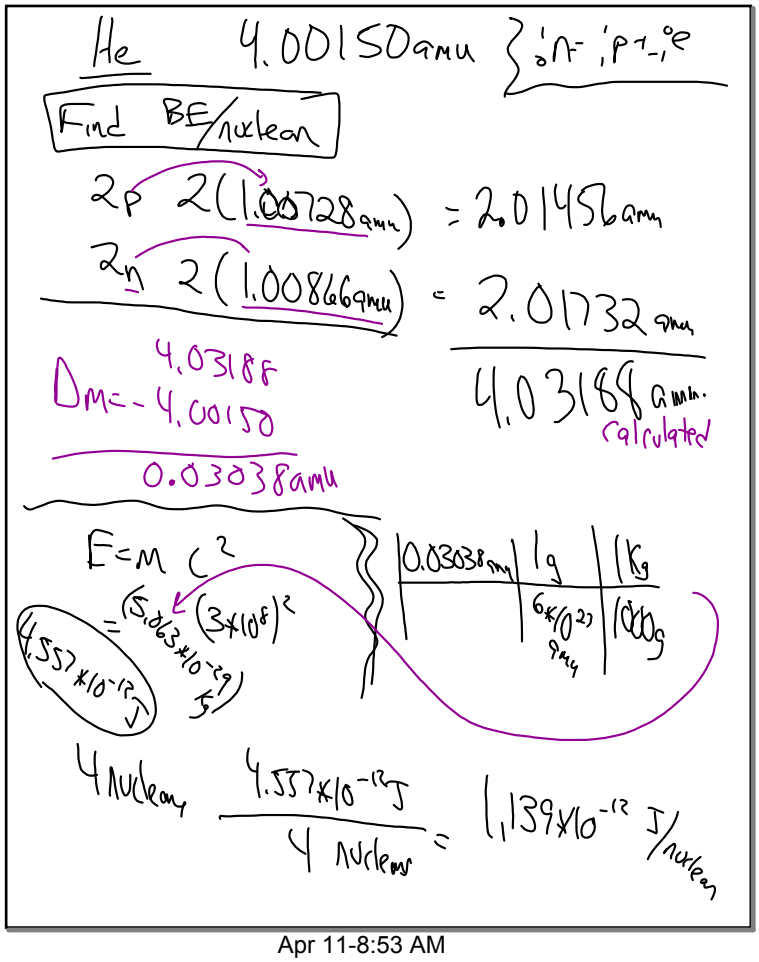
Apr 11-7:55 AM



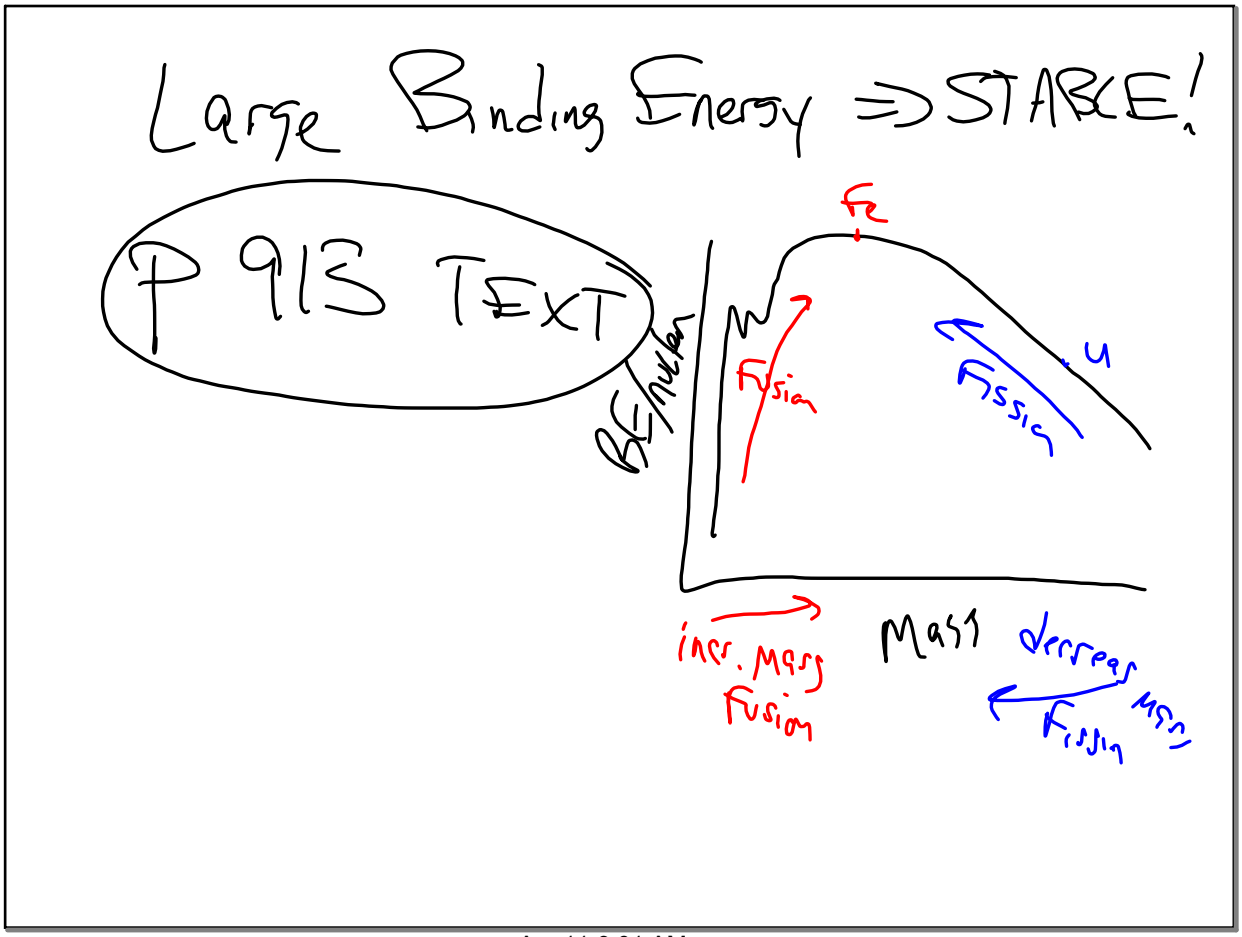
Apr 11-8:41 AM



Apr 11-8:45 AM



Apr 11-8:53 AM



Apr 11-9:01 AM

$^{7}_{3}Li$ mass = 7.01600 amu

Find BE

3p = 3(1.00728)

4n = 4(1.00866)

7.05852

7.01600

$\Delta M = 0.04052$ amu

$0.04052\,\text{amu} \left| \frac{1\,g}{6\times10^{23}\,\text{amu}} \right| \left| \frac{kg}{1000\,g} \right| = 6.75\times10^{-29}\,kg$

$E = mc^2$

$= (6.75\times10^{-29})(3\times10^{8})^2 = 6.078\times10^{-12}\,J$

Apr 11-9:05 AM

HW

21 # 48

Apr 11-9:14 AM