Nuclear Binding Energy

This program might be useful to a chemistry or physics teacher at the high school level.

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'Nuclear binding energy
'Version 2.0 by Scott Ausbrooks, May, 2011

'This program calculates the nuclear mass defect and the nuclear
'binding energy in both KJ/mol and MeV/nucleon

nomainwin
 WindowWidth = 900
 WindowHeight = 500
 button #1.button1,"Calculate",[action], UL, 10,30,120,50
 button #1.button2,"Clear",[clear], LL, 10,20,120,50
 button #1.button3,"Exit",[quit],LR,120,60,120,50
 textbox #1.textbox1, 650, 30, 180, 60 'measured mass of nucleus
 textbox #1.textbox2, 650, 130, 180, 60'mass# of isotope
 textbox #1.textbox3, 650, 230, 180, 60'atomic #
 textbox #1.textbox4, 110, 120, 180, 60'mass defect result
 textbox #1.textbox5, 110, 200, 180, 60'BE KJ/mol result
 textbox #1.textbox6, 110, 280, 180, 60'BE MeV/nucleon result
 statictext #1.measuredmass, "Measured mass ",500,40,110,50
 statictext #1.isotopicmass, "Isotopic mass # ",500,140,100,50
 statictext #1.atomicnum, "Atomic # ",500,250,100,50
 statictext #1.mdresult1, "Mass Defect",25,120,80,100
 statictext #1.mdresult2, "amu",300,130,45,45
 statictext #1.KJresult1, "Binding Energy",20,200,90,100
 statictext #1.KJresult2, " KJ/mol",290,215,90,35
 statictext #1.MeVresult1, "Binding Energy",20,290,90,75
 statictext #1.MeVresult2, "MeV / Nucleon",290,300,200,25

 open "Binding Energy Calculator" for window as #1
 print #1, "font times_new_roman 18 BOLD"
 print #1.textbox1, "!setfocus"
 print #1, "trapclose [quit]"
 wait
[action]
 print #1.textbox1,"!contents?"
 input #1.textbox1, actualmass$

 print #1.textbox2,"!contents?"
 input #1.textbox2, massnumber$

 print #1.textbox3,"!contents?"
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 input #1.textbox3, protons$
 mole = 6.022e23
 actualmass = val(actualmass$)
 massnumber = val(massnumber$)
 protons = val(protons$)
 neutrons = massnumber - protons
 massdefect = ((protons * 1.007276) + (neutrons * 1.008665) ) -
 actualmass
 KJ = (massdefect * 1.6606e-27 * ((2.9979e8)^2) * mole)/1000
 MeVperNucleon = ((KJ * 1000)/(mole *1.602e-13 * massnumber))

 print #1.textbox4, "!font times_new_roman 18 bold"
 print #1.textbox4, massdefect
 print #1.textbox5, "!font times_new_roman 18 bold"
 print #1.textbox5, KJ
 print #1.textbox6, "!font times_new_roman 18 bold"
 print #1.textbox6, MeVperNucleon
 wait

[clear]
 print #1.textbox1, ""
 print #1.textbox2, ""
 print #1.textbox3, ""
 print #1.textbox4, ""
 print #1.textbox5, ""
 print #1.textbox6, ""
 print #1.textbox1, "!setfocus"
wait

[quit]
 confirm "Really quit?";answer$
 if answer$ = "no" then wait
 close #1:end
```