Part One: Relative Dating

Assignment: Carefully study the cross-section shown below. Using capital letters (A, B, C, etc.), label the block showing the relative order of all events that happened (A = oldest). These events may include deposition of layers, folding, faulting, intrusions, unconformities, etc. Be very thorough!
Part Two: Radiometric Dating

Assignment: Create a graph that shows the decay of parent isotopes and accumulation of daughter atoms for a radioactive element with a half-life of 5,730 years. Assume that there are 1000 parent isotopes to begin with, and 0 daughter isotopes. Use the chart and a calculator (or spreadsheet) to make the graph, and then answer the questions at the bottom of the page. (If you don’t have graph paper, you can go to this website to print your own! http://www.printfreegraphpaper.com/)

To Start:

A) On your graph, the X-axis should show number of half-lives from 0 to 10, and the Y-axis should show the number of atoms (parent or daughter) from 0 to 1000.

B) Begin with 1000 atoms of the radioactive (unstable) parent element and 0 atoms of stable daughter atoms. Fill in the chart (bottom of page) to show the number of parent atoms that remain after each half-life step (from 1 to 10). At the same time, calculate the number of daughter atoms that are created at each half-life step. In the last row, show how many years have elapsed at each half-life step (one half-life = 5,730 years).

C) Use this chart (your calculations) to plot and connect points on the XY graph showing the decay curve of the parent isotopes. This curve should show a decrease in the number of parent atoms through ten half-lives.

D) Plot points on the XY graph to draw the accumulation curve of the daughter atoms, showing the increase in the number of atoms of stable daughter product through ten half lives.

* Your graph should show two different curves!

Now answer the following questions.

1) At what point in time (# of half-lives) will the number of parent atoms be equal to the number of daughter atoms? How many years is this?

2) What isotope has a half-life of 5730 years?

3) If you have 125 atoms of parent isotope, how old (number of years) is the sample?