Carbon Dating
Algebra I or Algebra II

Carbon dating is a method used to estimate the age of fossils, wood, or other tissue that was once living. Carbon is in all living things. The amount of C-14 in a living tissue remains about the same as its environment. When the organism dies the carbon is replaced by nitrogen. C-14 decays such that half of it remains after 5730 years. That is called its half-life time. In this lab we will be simulating what happens to carbon as it decays.

Materials Needed:

- Paper plate
- M&M's (used to represent C-14 atoms)
- Reeses Pieces (used to represent nitrogen atoms)

Procedure:

1. On your paper plate spill out your M&M's and count out 100. Make sure that the M is visible on the ones you use.
2. In your lists and spreadsheet (page 1.5) label column headings time and C-14 atoms. Record 100 atoms for time 0.
3. Mix the atoms on the plate and remove the ones with an M facing up. Record the number of C-14 atoms remaining on the plate in the list as time t=1. Then replace the decayed C-14 atoms with an equal number of nitrogen atoms (Reese's Pieces).
4. Mix the atoms up and repeat the above process until the carbon atoms are gone.
5. Plot your data and determine the model of best fit.

Questions:

1. When you looked at your scatterplot what type of function did you think was going to fit your data?
2. Was that function actually the best model?
3. When finding the regression formula did the calculator give you a message concerning domain? If so, why? What did you have to do to fix the problem?
4. In the general exponential equation f(x)=a(b)^x what does "a" represent and what does "b" represent? How does that apply to our lab?

Use what you have learned to answer the following question. A scientist finds a fossil that contains 6 units of C-14. A comparable mass today would contain 8 units of C-14. How old is the bone?