DEMONSTRATING THE HALF-LIFE OF A RADIOACTIVE ISOTOPE

Name_____ Block_____

Materials: 100 pennies, shoe box

Procedure:

1. Place 100 pennies in a shoe box so that all pennies are **heads** up.
2. Cover the shoe box and shake it **FIVE TIMES** vigorously so that the pennies are well mixed.
4. Open the shoe box and remove all pennies that are **tails** up.
5. Record on your data table the number of pennies **remaining** in the box.
6. Cover the box and shake it again.
7. Repeat Steps #1-5 until only one (or zero) penny remains.

Data Table:

Half-Life

Shakes ("Time")	Pennies in Box
0	100
5	
10	
15	
20	
25	
30	
35	
40	
45	

Conclusions:

1. Approximately what fraction of the remaining pennies was removed from the box after each shaking? _____

2. How many times did you shake the box before only one penny remained? _____

3. If someone stopped you and counted only 12 remaining, could he or she have calculated the time (in # of shakes) you started the experiment? _____ Explain:

4. Imagine that the shoe box is fossilized bone that contains 24 pug (picomicrogram) of radiocarbon. When it was buried, it contained 100 pug of radiocarbon. If the half-life of radiocarbon is 5730 years, how old is the bone? Show your work: