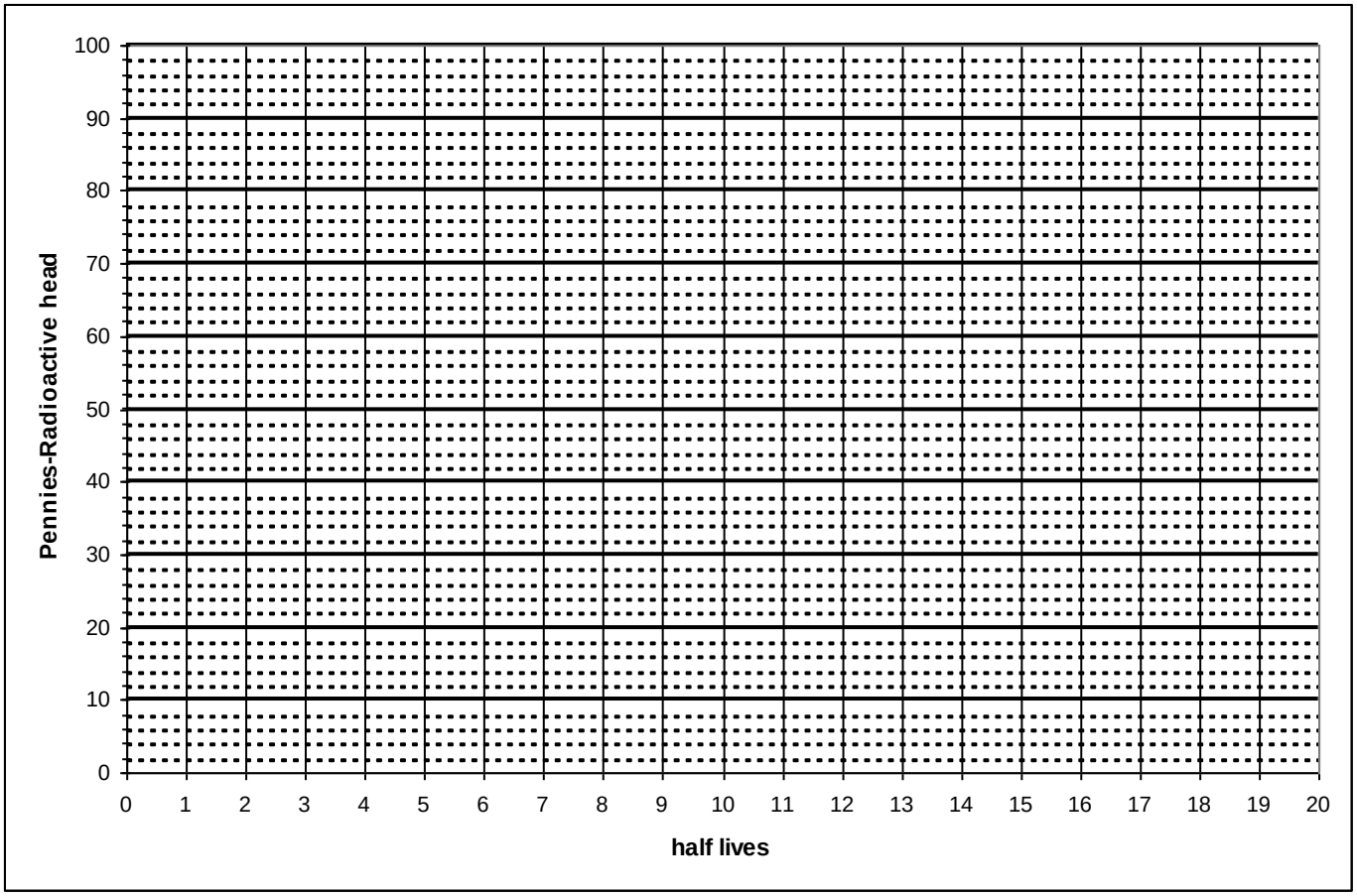
Radioactive Half Life

Procedure:

Put 100 coins in a cup, shake, dump out coins, separate heads from tails. Count the heads and return them to cup (they are radioactive carbon 14). Create a graph similar to the one below in your lab notebook. Record the # of heads on graph. Repeat until all coins are tails and you have none left. Use the graph to answer the following questions.



Discussion Questions

1. What happened and why?
2. If you found an object with 20 molecules of C^{*14}, what could you conclude?
3. If you found an object with 3 molecules of C^{*14}, what could you conclude?
4. Why can't (or can you) you determine if a object is 100,000 years old using C^{*14} data. Cite some specific data to support your argument.
5. What is the half life of C^{*14} - you may need to look this up.

Problem Set

(Please do not use a calculator (hint no logs required… use logic) and show each step/logic in your answer).

1. A sample if radioactive waste has a half-life of 20 years and an activity level of 4 curies. After how many years will the activity level of this sample be 0.50 curies?
2. After 200 million years, only 1/16 of the original amount of a particular radioactive waste will remain. The half life of this radioactive waste is how many million years?