Half-Life Lab

Objective:

Demonstrate the concept of half-lives using pennies to represent radioactive atoms undergoing a predictable change.

Materials:

- (100) pennies
- box for pennies
- provided graph to complete
- pens/pencils
- stopwatch

SAFETY

Follow all regular lab safety procedures.

Procedure:

1. Each student should have a box containing 100 pennies. Open the box and position every penny face up. When you are done, all 100 pennies should show heads.

2. On the graph paper provided, mark the number 100 as the starting amount on the vertical axis.

3. Close the box and shake it for ten seconds. For this lab, ten seconds represents the half-life of a radioactive element.

4. Open the box and remove any pennies that have flipped over and are now showing tails instead of heads. A penny that shows tails represents an atom that has undergone radioactive decay.

5. Count the number of pennies remaining in the box, and record the number on your graph as the number of atoms that are still radioactive after one half-life.

6. Repeat steps 3-5 until you complete a total of five half-lives. Record your results.

Questions:

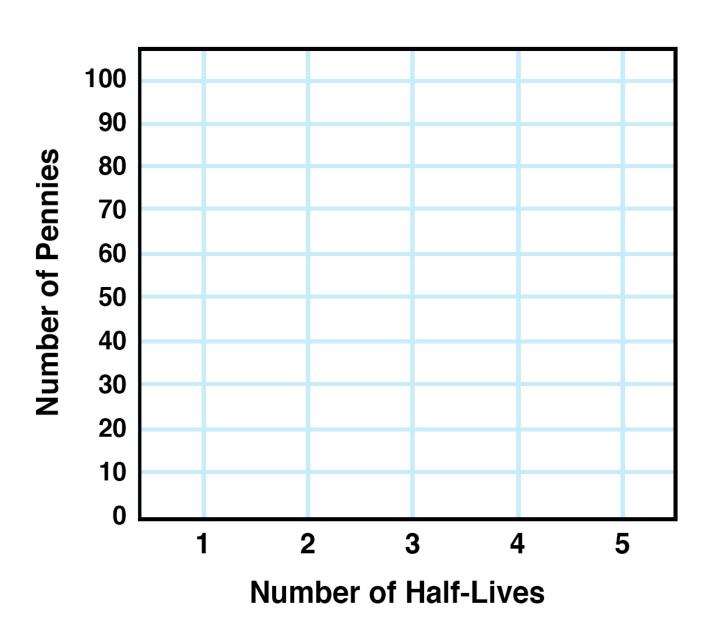1. Looking at the graph you created, what can you tell about the half-lives of the pennies?

2. How many half-lives would it take to get rid of almost the entire original sample of parent atoms?