**Chemistry Lab**

**The Radioactive Decay of "Pennium" Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Period\_\_\_\_\_**

## Problem

What is the half-life of the fictitious radioisotope "pennium"?

Hypothesis

## Procedure

1. Count 100 pennies. Put them back into the plastic cup.
2. Pour the pennies into the box.
3. Cover the box and shake up and down 20 times while timing this decay process. Record your time in seconds. Assume each decay process takes this same amount of time, so keep adding on this number of seconds to the last time in the table.
4. Uncover the box. Remove all the pennies that are tails up. They represent atoms that have under gone radioactive decay.
5. Count the heads up pennies as you put them back into the plastic cup. These are the undecayed atoms. Record your data in the data table.
6. Repeat steps 4-5 until you have no pennies left.

## Data

|  |  |
| --- | --- |
| Time (seconds) | Number of Undecayed Atoms  (heads up pennies) |
| 0 | 100 |
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Graph your data. Place the time on the X-axis and the number of undecayed atoms on the Y-axis. Be sure to label the X and Y-axis. Give your graph a title. Use the entire graph.

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## Analyze and Conclude

1. Define half-life.
2. What is the half-life of pennium in your experiment?
3. Explain how you arrived at the number in question 2.

## Apply and Assess

1. a. Does exactly the same fraction of pennium atoms decay during each half-life?

b. What does this suggest about half-life?

1. Why are such variations not likely to be obvious when actual atoms are involved?

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