Name: _____ Teacher: _____ Date: _____

# Finding the Half-Life of Pennium

In this activity, students will simulate the randomness of decay in radioactive atoms and visualize the half-life of a sample of radioactive material.

**MATERIALS:**

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| Ruler | 100 “Pennium” atoms | Masking tape | Cup |
| Tray marked with lines | Graph paper | Colored pencils | |

**PROCEDURE:**

1. Wear safety glasses! Place a 12-inch piece of masking tape at the front of your desk.

2. Get a bag of 100 “Pennium” atoms and a tray that has lines on the bottom, marked 3-inches apart.

3. Sprinkle the “Pennium” atoms (randomly) on the tray. Try to keep the pennies from stacking on top of one another.

4. “Pennium” atoms that touch the lines are decayed. Remove and count the decayed atoms.

5. The number of decayed atoms that you count will be the number of atoms that decayed in 1 minute. Record this number in the data table.

6. Place the decayed atoms in one stack at the far left of the masking tape. They will not be used again.

7. Subtract the number of decayed atoms in your first stack from 100. Record the difference in your data table as the number of atoms that REMAIN (after the decayed atoms are removed). This is the number of “Pennium” atoms LEFT after 1 minute.

8. Gather the remaining “Pennium” atoms (all the atoms not in the first stack) and place them back in the cup. Sprinkle them (randomly) on the tray.

9. Remove and count the decayed atoms (any that are touching a line).

10. Record this number in the data table (as the number decayed after 2 minutes).

11. Place the decayed atoms in a second stack, to the right of the first stack you made (Step 6).

12. Calculate the number of remaining atoms by subtracting the number of pennies in Stack 2 from the number of pennies REMAINING after 1 minute. Record this number on your data table as remaining atoms after 2 minutes.

13. Continue to sprinkle, count, record, and stack until only 0 or 1 penny remains.