



RADIOACTIVE PENNIES!



In this simulation, pennies will represent radioactive isotopes decaying. Heads will mean still radioactive, tails will represent stable (already decayed).

1. Obtain a plastic shoe box, 100 pennies, two half-sheets of graph paper (one per person), and two rulers (one per person).
2. Make sure all of the pennies are in the plastic shoe box and all are facing heads up. (All of the pennies are radioactive that way!)
3. Make a chart like the one below on one side of the graph paper (length-wise/vertically):

Total Number of Shakes	Pennies Unchanged (Still Heads)
0	100
5	
10	
...	...

4. Put the lid on the shoe box.
5. Shake the shoe box up and down **five times**. (Hold the lid on!)
6. Count how many pennies still have heads facing up.
7. Record that number in the chart
8. Remove the tails (stable) pennies from the box. (**Never put tails pennies back in.**)
9. **Repeat steps 4 through 8 until no “radioactive” (heads) pennies remain.** Only shake five times each time!
10. Return the box and pennies to your teacher.
11. On the back of the piece of graph paper, make a **line graph** of Unchanged (Heads) Pennies vs. Total Number of Shakes
 - a. Make the graph horizontal (side-to-side)
 - b. Make the graph large (to fill up most of the paper)
 - c. The x-axis will be Total Number of Shakes
 - d. The y-axis will be Number of Unchanged (Heads) Pennies
 - e. Draw a smooth curve through most of the points.
12. Indicate on the graph (using an arrow) where the first half-life occurred. It does not have to be one of your data points.
13. Indicate on the graph where the second half-life occurred. It does not have to be one of your data points.
14. If each shake stands for one year, what was the half-life of your radioactive pennies? Write your answer on your graph.
15. Write your name on your graph paper and turn it in!