Half-Life Activity Name: _____

Period: _____

Instructions:

1. Count out 64 Skittles from the fingerbowl and put them in your box. DO NOT EAT THE SKITTLES. OTHER STUDENT'S GRUBBY FINGERS HAVE BEEN ALL OVER THEM.
2. You will be assigned a time of length to shake your box of Skittles, either 30 seconds or 1 minute.
3. Close the lid on your box, and shake then for the amount of time you have been told.
4. Open the box, and put back in the fingerbowl the Skittles that have an S side facing up. Count how many you are removing, and put them in your data sheet below. If you are the 30 second group, make sure you fill out the 30 second half-life column!
5. Shake for a total of 5 minutes (10 removals for the 30 second group, 5 for the 1 minute groups).
6. Complete the number that you would expect for each half-life. Remember, that about ½ of the total you start with EACH time should be eliminated.
7. Next, get the data from a group that did the opposite time that you did. (If you did 30 seconds, find a group that did 1 minute, and share data).

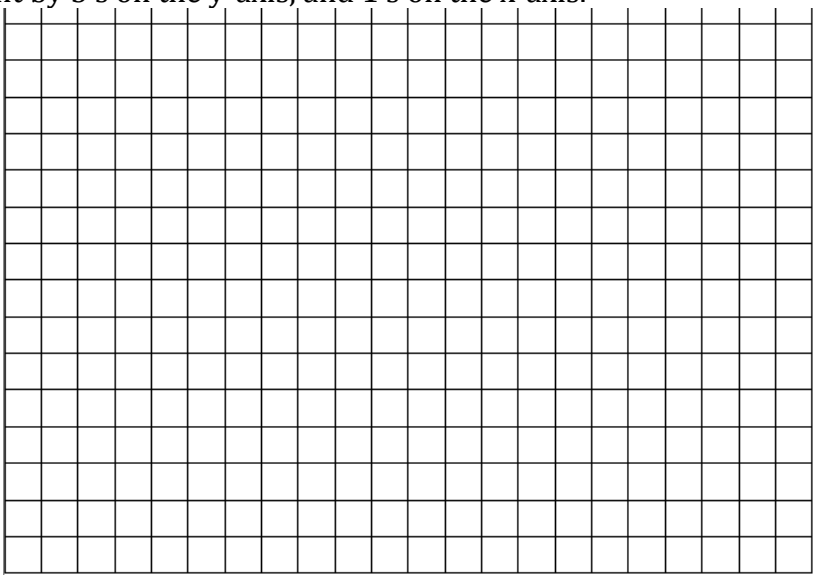
Removal (Half-lives)	30 seconds half-life	1 minute half-life	Expected number removed
1			32
2			16
3			
4			
5			
6			
7			
8			
9			
10			

Note that it doesn't matter how long you shake the box, after each removal, we expect the same number to remain. However, how LONG it takes does change.

This means, the length of the half life does matter, in order to figure out how long ago the breakdown started.

Analysis:

Draw a graph with 3 lines, in 3 different colors. One line should be the 30 second data, another is the 1 minute data, and the final one is the expected values. The X-axis is labeled for you. The Y-axis should be labeled. I would count by 5's on the y-axis, and 1's on the x-axis.



Removals

1. How many were LEFT after two minutes in the box that was shaken for 30 seconds?

2. How many were LEFT after two minutes in the box that was shaken for 1 minute?

3. How many times more were left in the 1 minute box compared to the 30 second box, after 2 minutes?

4. Is this what you would expect, mathematically? Was it close?

5. If the half-life for something was 3 years, how long would it take for 75% (or ¾) of it to break down?

6. If you had 12.5% of a material remaining, how many half-lives would have to occur from when the material was new (at 100%)?

7. If the material in question 6 had a half-life of 100 years, how old would it have been?