Activity 5 - Radioactive Decay:
A Sweet Simulation of Half-Life

Purpose: To simulate the nuclear decay of a radioisotope.

Materials: "Candium" atoms (Skittles candy)

Procedure:

1. Obtain a bag of Candium from the teacher.
2. Count the number of atoms in your sample and record in the data table below as your initial number of un-decayed atoms.
3. Gently pour out candy.
4. Count the number of pieces with the print side down. These atoms are un-decayed. Record this number in the data table.
5. The atoms that landed with the print side up are decayed. You can consume them.
6. Return only the pieces with the print side down to the bag. Reseal the bag.
7. Gently shake the sealed bag for 10 seconds.
8. Continue shaking, counting, and consuming until all the atoms have decayed.
9. Record your group data on the overhead.
10. Copy down the class data once it has been totaled.
11. Construct a graph of the number of the total number of un-decayed atoms versus half-lives, using the class data. Label the axes appropriately and include a title.
12. Use the graph to answer the conclusion questions.

Data:

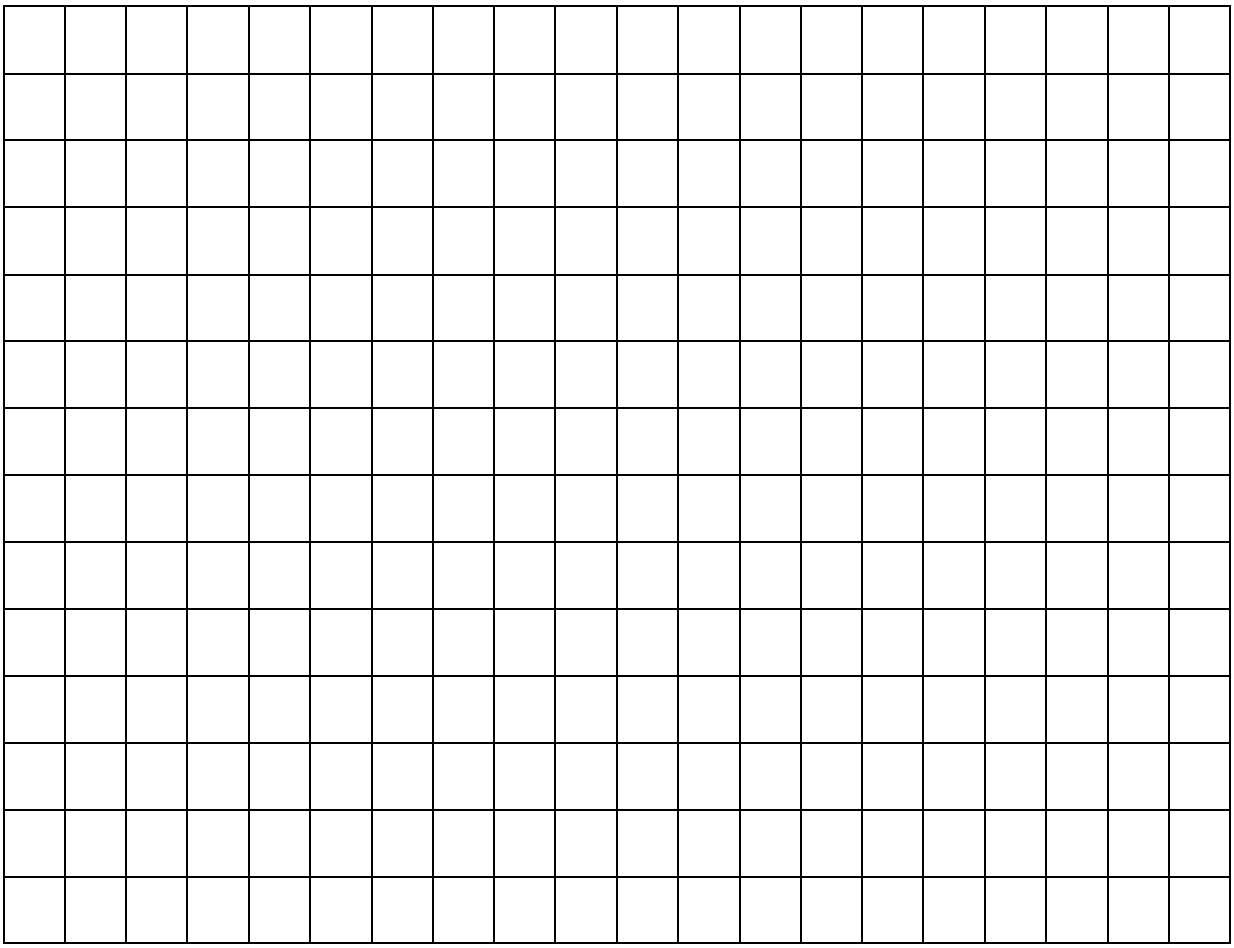
Group Data:

Half-life	# of Undecayed Atoms
Initial	
1	
2	
3	
4	
5	
6	
7	

Total Class Data:

Half-life	Total # of Undecayed Atoms
0	
1	
2	
3	
4	
5	
6	
7	

Graph of Class Data:



Conclusion Questions:

1. Is your graph of the class data a straight line? What does the shape of the line tell you about how a radioisotope decays?

2. Why did we pool the class data? How does this relate to radioactive nuclei?

3. Is there a way to predict when a specific piece of candy will land marked side down? If you could follow the fate of an individual atom in a sample of radioactive material, could you predict when it would decay? Explain.

4. What is the approximate half-life of candium, in seconds? How do you know?

5. How many undecayed candium atoms would remain in a sample of 600 nuclei after 2 half-lives?