FLINN SCIENTIFIC

Name_____

Half-life Simulation Worksheet

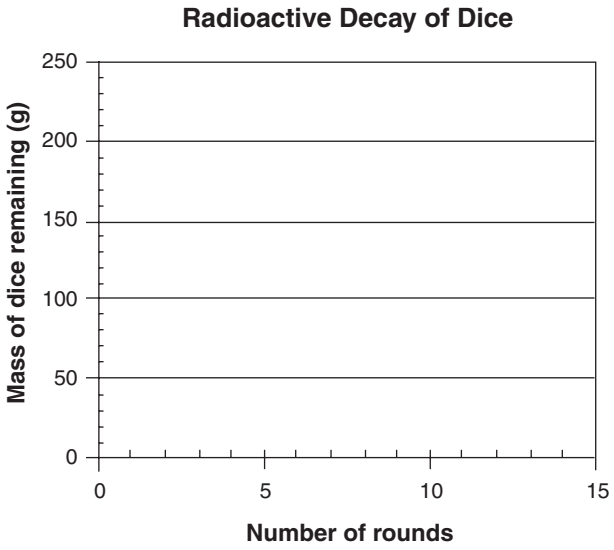
Data Table

Assigned "decay number"			
Round	**Mass of dice (initial) (g)**	**Mass of dice that "decayed" (g)**	**Mass of dice remaining (g)[1]**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			

[1]*The mass of dice remaining will equal the mass of dice (initial) for the next round.*

Questions *(Use a separate sheet of paper to answer the following questions.)*

1. Graph the results obtained for the "radioactive decay" of dice. *Note:* Include a point on the graph for the mass of dice "remaining" after zero rolls of the dice (Round zero).



2. Determine the half-life: Choose two points on the *y*-axis, where the first point is about twice as large as the second point (e.g., 200 g of dice and 100 g of dice). How many rounds are needed for one-half of the dice to decay?

3. Verify the half-life value by choosing another set of two points on the *y*-axis. Is the half-life a "constant" for the decay of the dice?

4. Predict the value of the half-life that would be obtained using the same-sided dice but a different "decay number." Does the half-life depend on the "decay number" that was assigned? Explain, based on probability.

5. Using the value of the half-life determined in Questions 2 and 3, predict what mass of dice should have remained after 9 rounds. Compare this with the number of dice that actually remained (see the Data Table). What factors might account for any difference between the predicted and actual mass of dice remaining after 9 rounds?

6. Using the concept of half-life, predict the number of rounds that would be needed to reduce the mass of dice from 10,000 g to 625 g using 6-sided dice and one "decay" number.