Name_____ Date_____

Geologic Age Lab Report

Directions: Follow the procedure to simulate finding the half-life of an element.

Geologic Age

Geologists use radioactive elements to determine the absolute age of rocks. As elements decay, they undergo radioactive decay, changing into daughter elements and releasing energy. This happens at a set rate, and scientists can measure this rate as the half-life of the element. Today, you will experiment with finding the half-life of a fictional element.

Materials

- shoe box with lid
- 100 cubes (can be dice, sugar cubes, homemade cubes, Styrofoam, etc.)
- permanent marker

Procedure

1. The cubes represent the imaginary chemical element, Lokium.
2. Mark only one side of each cube with a permanent marker. If you are using dice, you will focus on the dice that land with the 1 side facing up.
3. Place all 100 cubes into the shoebox.
4. Holding the lid tightly, turn the box over twice.
5. Remove the lid and take out the cubes that have the marked side up. If you are using dice, take out the dice that landed with the 1 side facing up. These cubes represent atoms that have decayed into the daughter element, DOL (daughter of Lokium).
6. In the data table below, record the number of cubes removed and the number of cubes remaining beside Trial 1. Do not put the cubes you removed back into the box. Start again with the remaining number of cubes.
7. Repeat steps 4 to 6 until you have completed 12 trials, or until all the cubes have been removed.
8. Now repeat the entire process from step 3, collecting data on the second chart.

Data Collection

As you complete the experiment, take notes on what you observe.

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Journaling of Observations:

Data Table Test 1:

Trial	Number of cubes removed	Number of cubes remaining
Trial 1		
Trial 2		
Trial 3		
Trial 4		
Trial 5		
Trial 6		
Trial 7		
Trial 8		
Trial 9		
Trial 10		
Trial 11		
Trial 12		

Data Table Test 2:

Trial	Number of cubes removed	Number of cubes remaining
Trial 1		
Trial 2		
Trial 3		
Trial 4		
Trial 5		
Trial 6		
Trial 7		
Trial 8		
Trial 9		
Trial 10		
Trial 11		
Trial 12		

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1. After completing the data collection charts, construct a graph to represent the data in each table. On the vertical axis, plot the number of cubes remaining each time. On the horizontal axis, plot the trial numbers.
2. Connect the points you plotted. Draw a best fit line for these points. Use the space below to draw your graphs or upload a picture of your graphs using the image tool.



Data Analysis

Before drawing conclusions, you will need to look for patterns and trends in the data. Write a paragraph describing the data and any patterns or trends you see in your graphs of the half-life. Include the following in your paragraph:

- What is the half-life of the element Lokium?
- After which trial did you reach the half-life of Lokium, for each test?
- How do the graphs compare?
- What would you expect a third test to look like?

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Drawing Conclusions

Having studied the data for patterns and trends, you should now be able to draw some conclusions about how knowing the half-life of the element Lokium would help you determine the absolute age of rock in which this element is found. In a paragraph, create an imaginary example of finding a given amount of Lokium and DOL in a rock, and then determining the absolute age of that rock. Assume that each trial represents 1,000 years.

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