Instructions:

* Stand up. When prompted flip your penny. Heads = U238 Tails = Pb206
* Each flip represents the half-life of Uranium -238, 4.5 billion years.
* If you flip Pb206, then you have decayed and need to sit down.
* Make sure to fill in the data table after each round.
* Graph your data for both U238 and Pb206

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial 1 | Start | 1st Flip | 2nd Flip | 3rd Flip | 4th Flip | 5th Flip | 6th Flip | 7th Flip |
| U238 (heads) |  |  |  |  |  |  |  |  |
| Pb206  (tails) |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial 1 | Start | 1st Flip | 2nd Flip | 3rd Flip | 4th Flip | 5th Flip | 6th Flip | 7th Flip |
| U238 (heads) |  |  |  |  |  |  |  |  |
| Pb206  (tails) |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial 1 | Start | 1st Flip | 2nd Flip | 3rd Flip | 4th Flip | 5th Flip | 6th Flip | 7th Flip |
| U238 (heads) |  |  |  |  |  |  |  |  |
| Pb206  (tails) |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 100 |  |  |  |  |  |  |  |
| 80 |  |  |  |  |  |  |  |
| Uranium -238  60 |  |  |  |  |  |  | Lead - 206 |
| 40 |  |  |  |  |  |  |  |
| 20 |  |  |  |  |  |  |  |
| 0 |  |  |  |  |  |  |  |

6th Half life

7th Half life

5th Half life

4th Half life

3rd Half life

1st Half life

2nd Half life

1. Explain the trends in your graph for both Uranium and Lead.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. If you started with a sample of 600 radioactive nuclei, how many would remain undecayed after  three half-lives? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. If 175 undecayed nuclei remained from a sample of 2800 nuclei, how many half-lives have passed?  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. How many half-lives would it take for 6.02 x 1023 nuclei to decay to 6.25% (0.376 x 1023) of the original number of nuclei?  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_