Radioactive Dating Game

Go to [**http://tinyurl.com/amm3j7x**](http://tinyurl.com/amm3j7x) [[1]](#footnote-1)

First take a few minutes to play with the simulation while everybody gets his or her machine working.

*Make sure to answer every question using full sentences to explain your answers as needed.*

Now that you have explored a bit on your own click the tab that says: ***half-life.***

Press: add 10 (under the atom bucket) until you have 100 atoms.

1. How many years did it take for *half* the carbon to turn to nitrogen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many years did it take for *all* the carbon to turn to nitrogen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Try the Uranium. How many years did it take for *half* the uranium to turn to lead? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Try the Uranium. How many years did it take for *all* the uranium to turn to lead? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Go to custom. Select the half-life you want.

1. Did it work, how long was your half-life decay? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Now click the tab that says **Decay rates**

1. Fill in the table

|  |  |  |
| --- | --- | --- |
| Time for decay to: | Carbon 14 | Uranium 238 |
| 100% |  |  |
| 75% |  |  |
| 50% |  |  |
| 25% |  |  |

Measurement.

1. Plant a tree. How many percent carbon 14 does the living tree have: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Now kill the tree. Explain how carbon 14 can be used to figure out how old the log is.

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



1. Erupt the volcano. Can you use c14 to date the rock? Why, why not.

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

Now try the Uranium 238.

1. How long does it take for 10% of the Uranium to brake down?

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

1. Would Uranium 238 be a good choice for estimating the age of an eruption that likely happened within the last million years? Why, why not.

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**Dating game** play with the simulation to find the age of the objects and fill in the table.

|  |  |  |
| --- | --- | --- |
| Object | Age | Isotope used to estimate |
| House |  |  |
| Living tree |  |  |
| Dead tree |  |  |
| First skull |  |  |
| Cup |  |  |
| Second human skull |  |  |
| Dinosaur skull |  |  |
| Trilobite |  |  |
| Brown rock on the bottom |  |  |



1. Or if that does not work try

**http://phet.colorado.edu/en/simulation/radioactive-dating-game#related-simulations** [↑](#footnote-ref-1)