

Name:

Class:

Radiometric Dating Review Problems

1. Element X that decays into element Y with a half-life of 50years. Which is the parent? Which is the daughter? Which is radioactive? Which is stable?

2. Fill out the data table for X and Y below.

# of half-lives	0	1	2	3	4
% Parent atoms					
% Daughter atoms					
# of years old					

3. An animal fossil was found to have 25% X and 75% Y in its bones.

- How many half-lives of element X have passed?
- How old is the fossil?

4. If an animal fossil was 150 years old, what would be the ratio of parent to daughter elements for the S and Y atoms above?

5. If a plant fossil was 200 years old, how many half-lives would have passed? What would be the ratio of parent to daughter atoms?

6. Element Zap decays into element Paz with a half-life of 250years. Which is the parent? Which is the daughter? Which is radioactive? Which is stable?

7. Complete the data table for element Zap that decays into element Paz with a half-life of 250 years.

# of half-lives	1	2	3	4	5
# of years old					
Fraction of Parent atoms	1/2				
Fraction of Daughter atoms	1/2				

8. If a Truffala tree fossil was found with a 1/16 Zap: 15/16 Paz ratio, how many half-lives have passed? How old is the Truffala tree fossil?

9. A Lorax fossil is found in layers above the Truffala tree, would you expect it to be younger or older? Using what dating method?

10. If a third fossil was suspected to be 750yrs old what would be the parent to daughter element ratio?

The iceman, Otzi, was found frozen in the Italian Alps wearing grass shoes and goat skin clothes. They found 50% of the expected level of Carbon-14 in Otzi's body. Carbon-14 decays into Nitrogen-14 with a half-life of 5,730 years.

12. Which atom is the parent? Daughter? Stable? Radioactive?

13. How did the Carbon-14 get into his body in the first place?

14. What % C-14 did he have when alive? Why is there less now?

15. Complete the data table for C-14 that decays into element N-14 with a half-life of 5,730 years.

# of half-lives	0	1	2	3	4
% Parent atoms					
% Daughter atoms					
# of years old					

16. How long ago was he alive (when did he die?). Explain how you know.

17. What is the method you are using to determine the age of Otzi's mummy? How does it work?

Human remains in a South African cave were found to be 17,190 years old by measuring the Carbon-14.

18. How many C-14 half-lives must have passed to be that old?

19. If you were the scientist that sampled the tissue in these human remains, what would be the parent to daughter atom ratio (by %) that you measured?

20. Extension: You could determine the age of Otzi's grass shoes, his clothes and the wooden handle on his axe but not the copper blade on his axe. Explain why some of these things could be measured and not others.