

Calculating Half-Life Problems

Name _____ Block _____

How to Calculate Half-Life Problems:

THE PROBLEM:

An isotope of cesium (cesium-137) has a half-life of 30 years. If 1.0 g of cesium-137 disintegrates over a period of 90 years, how many grams of cesium-137 would remain?

THE SOLUTION:

1. Draw a T-Table:

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2. Label the left side with the unit of time mentioned in the problem.

TIME (yrs)	

3. Label the right side with the mass mentioned in the problem.

TIME (yrs)	MASS (g)

4. Begin by always writing a zero in the **TIME COLUMN**.

TIME (yrs)	MASS (g)
0	

5. Then, in the **TIME COLUMN** add one half-life at a time till you reach the total time given in the problem.

TIME (yrs)	MASS (g)
0	
30	
60	
90	

6. In the **MASS COLUMN**, always start with the mass originally given in the problem.

TIME (yrs)	MASS (g)
0	1.0
30	
60	
90	

7. Then keep dividing the number in the **MASS COLUMN** by 2 for each number of half-lives on the left column.

TIME (yrs)	MASS (g)
0	1.0
30	.50
60	.25
90	.125

8. The rules are:

- Add half-lives on the left.
- Divide by 2 on the right.

Add Half-Life	Divide by 2

9. How many times you added a half-life in the **TIME COLUMN** equals how many half-lives have occurred.

10. The last amount of mass at the bottom of the **MASS COLUMN** equals how much mass is left after radioactive decay has occurred.