

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

TIME (yrs)	MASS (g)
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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.

<b>Add Half-Life</b>	<b>Divide by 2</b>

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.