

## Student Exploration: Half-Life

**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.)

1. What does your teacher tell you about the relationship between the number of atoms of a radioactive substance and the number of half-lives?

1. The number of atoms is halved every half-life.

2. If you have 100 atoms of a radioactive substance, how many atoms of the substance will you have after 3 half-lives?

12.5 atoms of the substance will remain after 3 half-lives.

**Gizmo Description**

The Gizmo simulates a radioactive substance. A **radioactive** substance is one that undergoes **radioactive decay**, a process in which unstable atomic nuclei lose energy by emitting **ionizing radiation**. Radioactive decay is a random process, and the number of atoms of a radioactive substance that will decay in a given time interval is unpredictable. However, the **half-life** of a radioactive substance is the time it takes for half of the atoms of the substance to decay.

The Gizmo lets you simulate a radioactive substance and measure the number of atoms of the substance that remain. The number of atoms of a substance is shown in the **Graph** (left).

1. What is the half-life of the substance?

1. The half-life is 10 seconds.

**Notes:** The following simulation starts with 100 **radioactive** atoms. The number of atoms of the substance is shown in the **Graph** (left).

2. What number of atoms of the substance do you have after 1 half-life?

50 atoms.

3. In the simulation, what is the probability of a given atom decaying in a given time interval?

The probability of a given atom decaying in a given time interval is 50%.

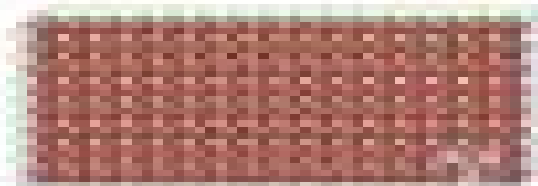


Figure 1: A graph showing the number of atoms of a radioactive substance over time. The x-axis is labeled 'Time (seconds)' and ranges from 0 to 100. The y-axis is labeled 'Number of atoms' and ranges from 0 to 100. The graph shows a series of red dots representing the number of atoms at each second. The number of atoms starts at 100 at time 0 and decreases exponentially, following a half-life of 10 seconds. The number of atoms is 50 at 10 seconds, 25 at 20 seconds, 12.5 at 30 seconds, 6.25 at 40 seconds, 3.125 at 50 seconds, 1.5625 at 60 seconds, 0.78125 at 70 seconds, 0.390625 at 80 seconds, and 0.1953125 at 90 seconds. The number of atoms reaches 0 at 100 seconds.



# Half Life Gizmo Answer Key

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Guthrie, Neltje Marie Tannehill Shimer**

**Half Life Gizmo Answer Key:**

This book delves into Half Life Gizmo Answer Key. Half Life Gizmo Answer Key is a vital topic that needs to be grasped by everyone, from students and scholars to the general public. This book will furnish comprehensive and in-depth insights into Half Life Gizmo Answer Key, encompassing both the fundamentals and more intricate discussions.

1. This book is structured into several chapters, namely:

- Chapter 1: Introduction to Half Life Gizmo Answer Key
- Chapter 2: Essential Elements of Half Life Gizmo Answer Key
- Chapter 3: Half Life Gizmo Answer Key in Everyday Life
- Chapter 4: Half Life Gizmo Answer Key in Specific Contexts
- Chapter 5: Conclusion

2. In chapter 1, this book will provide an overview of Half Life Gizmo Answer Key. The first chapter will explore what Half Life Gizmo Answer Key is, why Half Life Gizmo Answer Key is vital, and how to effectively learn about Half Life Gizmo Answer Key.

3. In chapter 2, this book will delve into the foundational concepts of Half Life Gizmo Answer Key. This chapter will elucidate the essential principles that must be understood to grasp Half Life Gizmo Answer Key in its entirety.

4. In chapter 3, the author will examine the practical applications of Half Life Gizmo Answer Key in daily life. The third chapter will showcase real-world examples of how Half Life Gizmo Answer Key can be effectively utilized in everyday scenarios.

5. In chapter 4, this book will scrutinize the relevance of Half Life Gizmo Answer Key in specific contexts. The fourth chapter will explore how Half Life Gizmo Answer Key is applied in specialized fields, such as education, business, and technology.

6. In chapter 5, this book will draw a conclusion about Half Life Gizmo Answer Key. The final chapter will summarize the key points that have been discussed throughout the book.

The book is crafted in an easy-to-understand language and is complemented by engaging illustrations. This book is highly recommended for anyone seeking to gain a comprehensive understanding of Half Life Gizmo Answer Key.

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