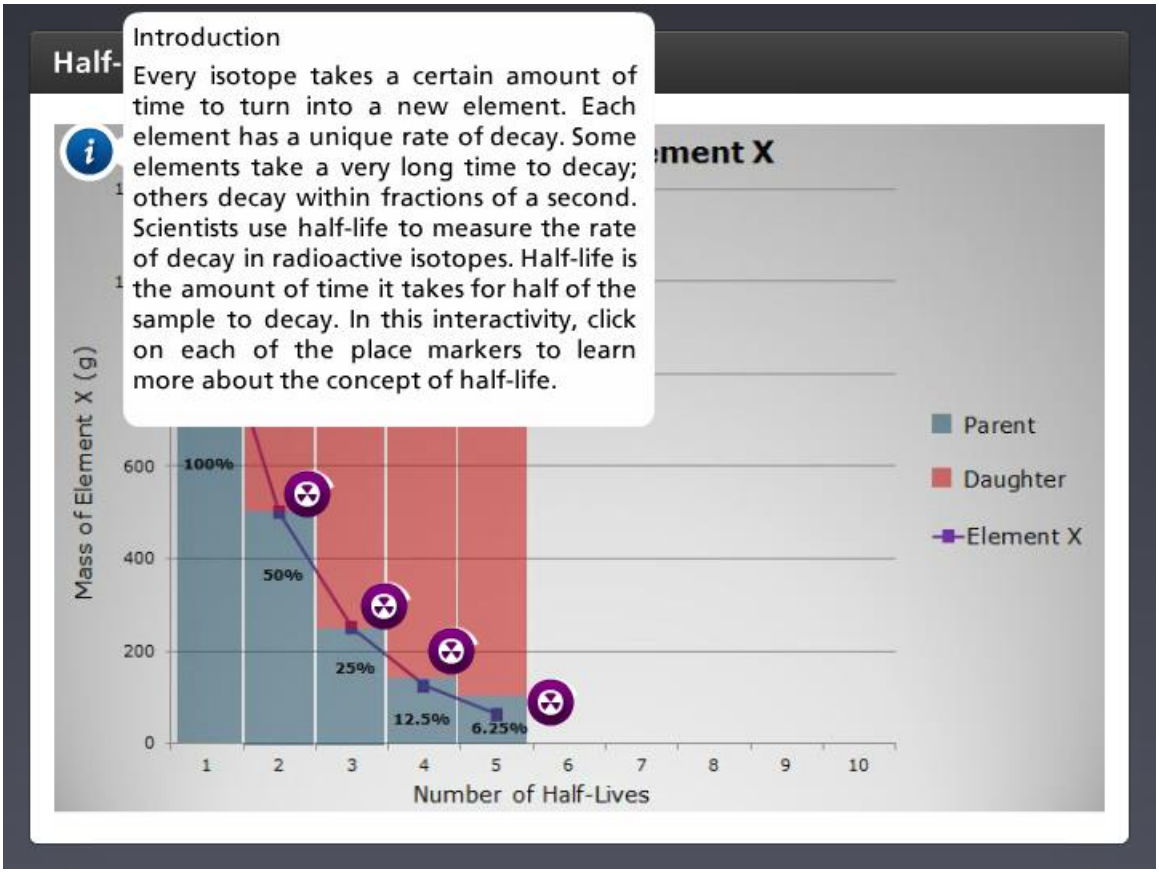
Module 2: Atomic Structure and the History of Atomic Theory
Topic 5 Content: Half-Life Presentation Notes

Introduction



Every isotope takes a certain amount of time to turn into a new element. Each element has a unique rate of decay. Some elements take a very long time to decay; others decay within fractions of a second. Scientists use half-life to measure the rate of decay in radioactive isotopes. Half-life is the amount of time it takes for half of the sample to decay. In this interactivity, click on each of the place markers to learn more about the concept of half-life.

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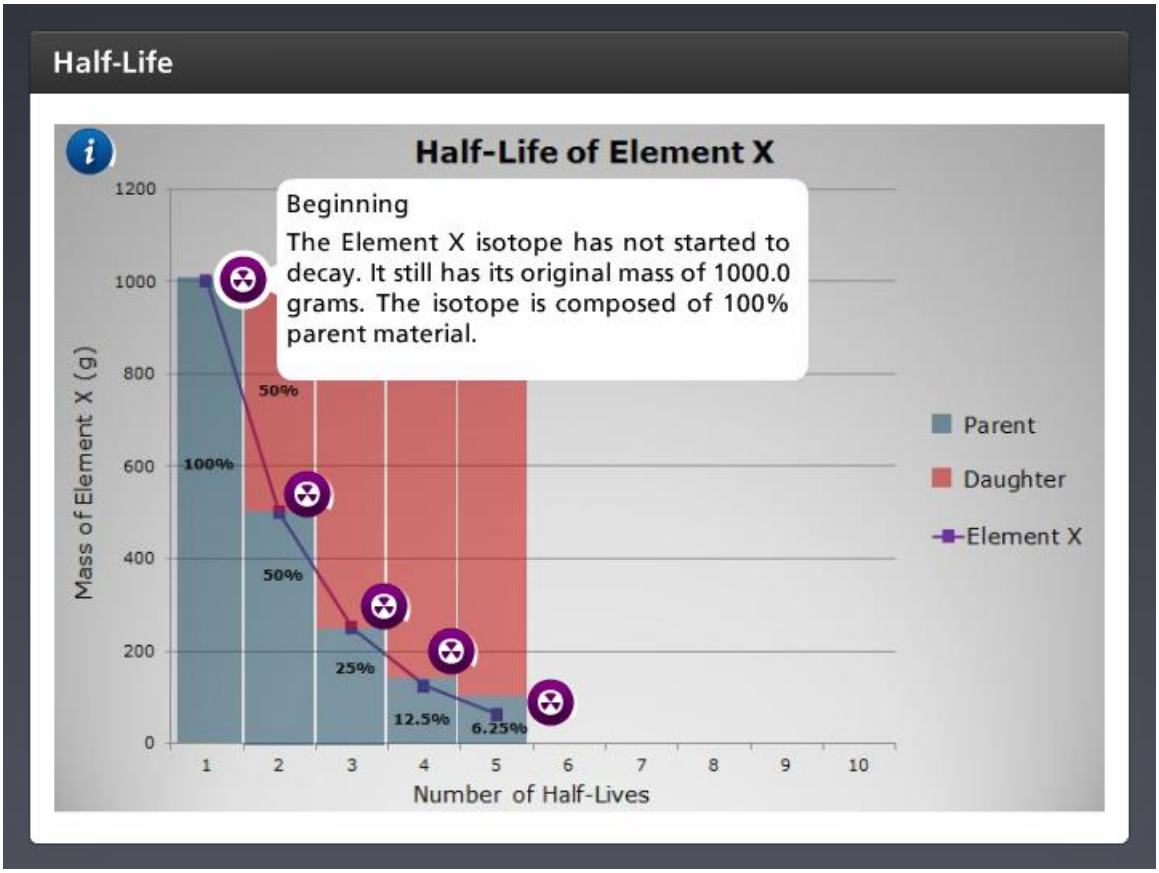
Beginning



The Element X isotope has not started to decay. It still has its original mass of 1000.0 grams. The isotope is composed of 100% parent material.

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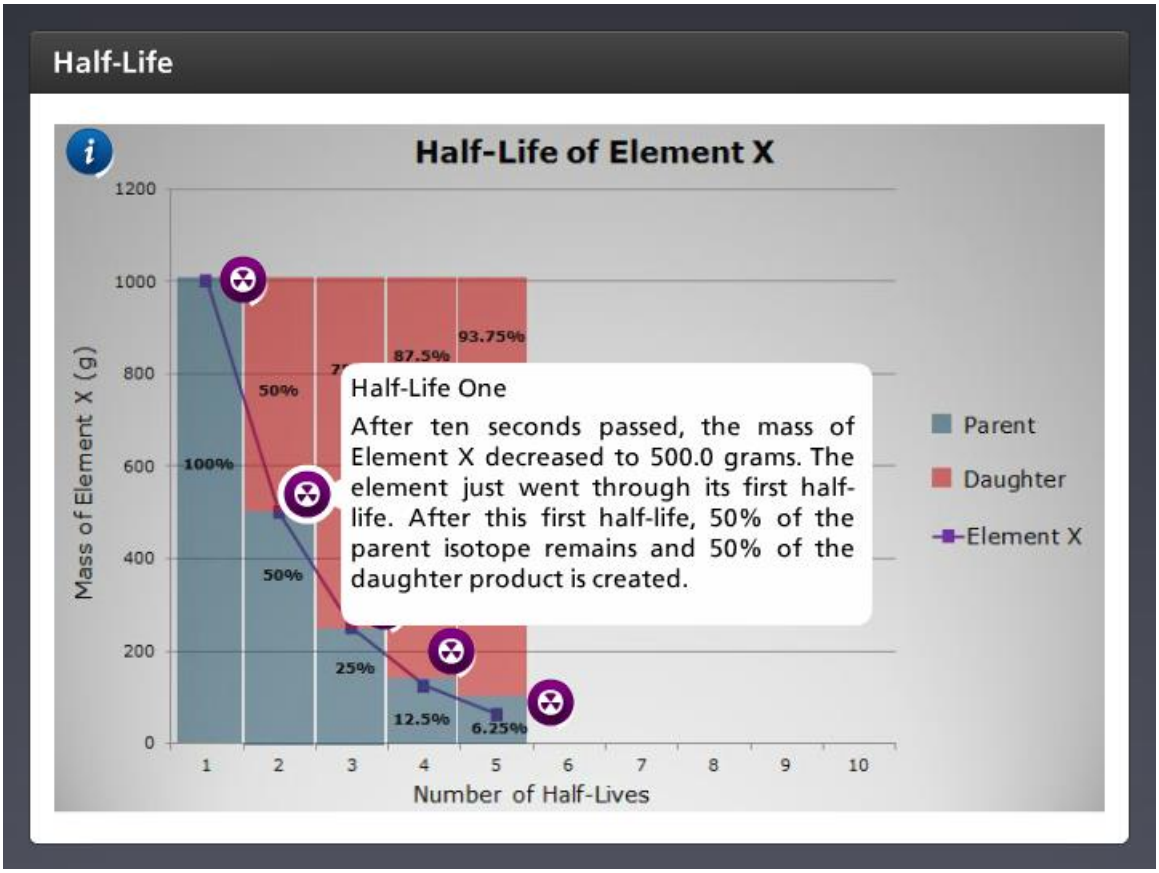
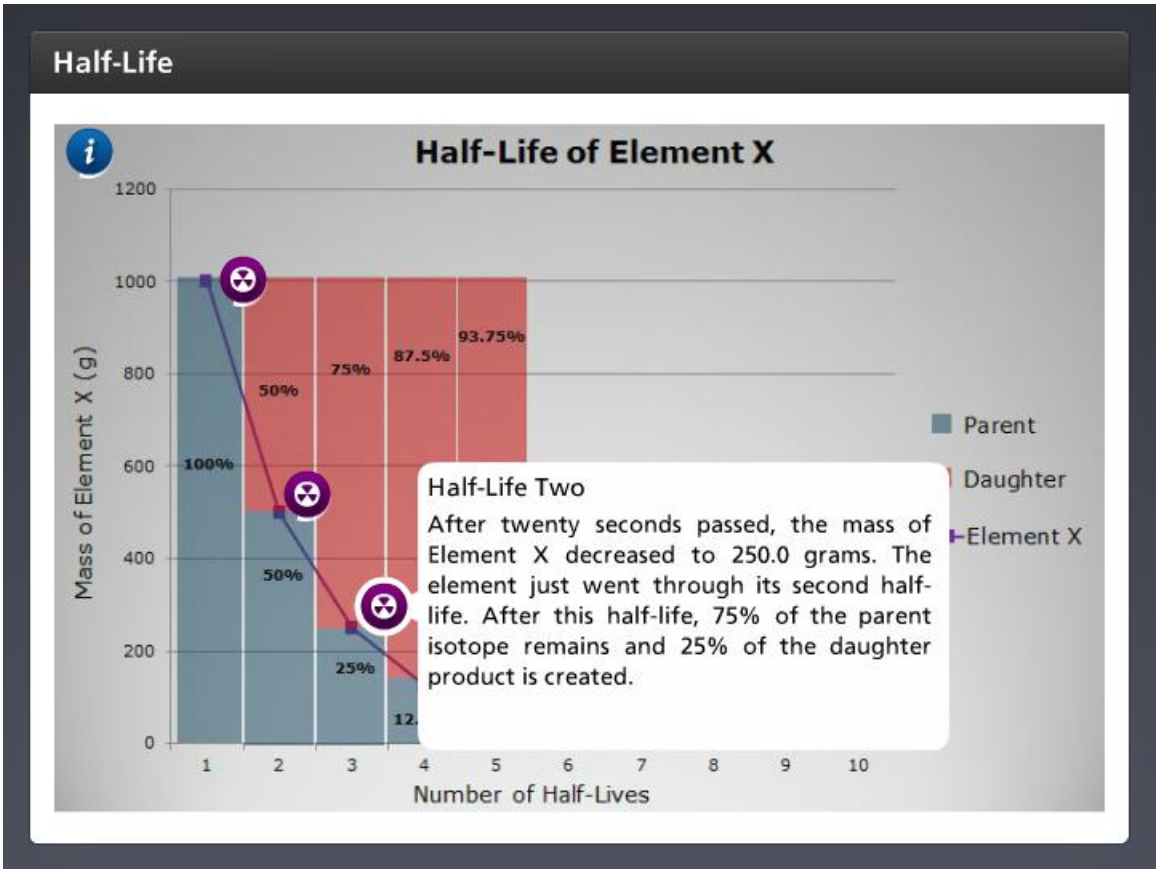
Half-Life One



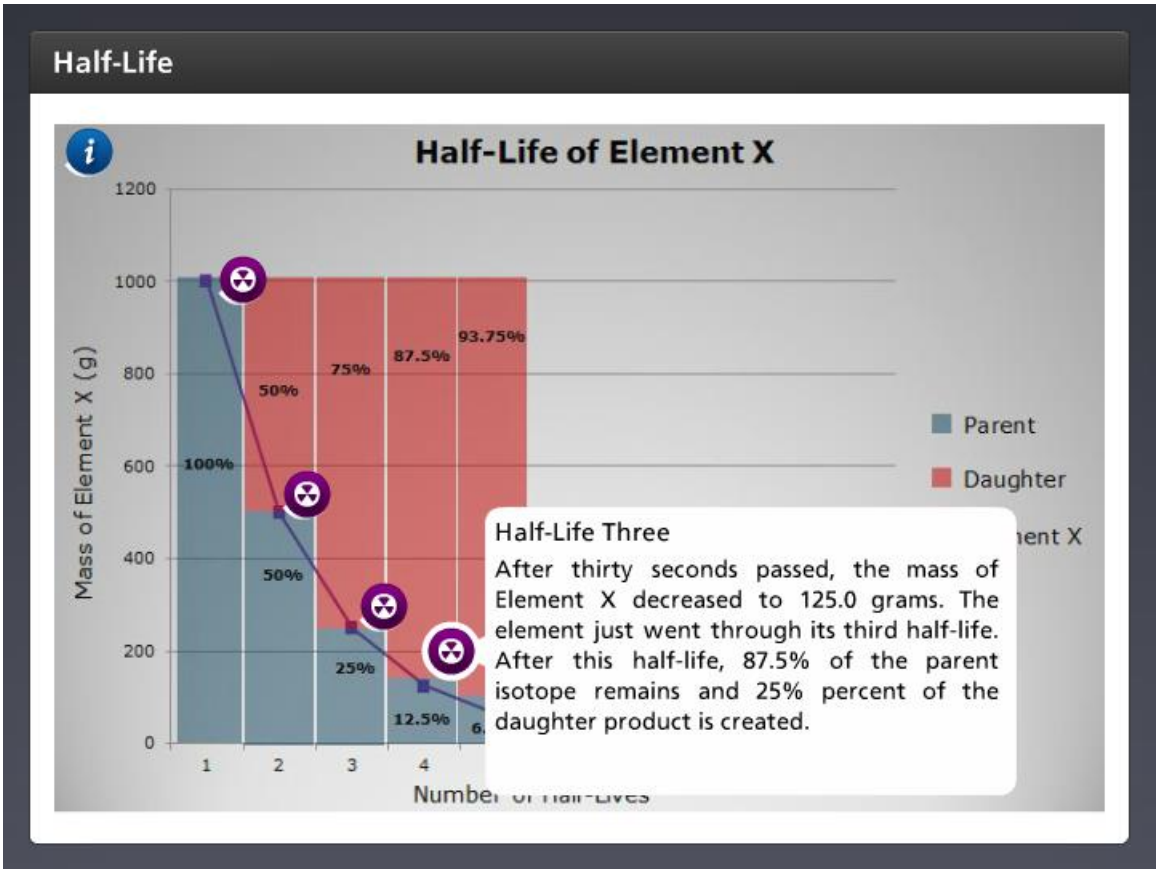
After ten seconds passed, the mass of Element X decreased to 500.0 grams. The element just went through its first half-life. After this first half-life, 50% of the parent isotope remains and 50% of the daughter product is created.

Half-Life Two



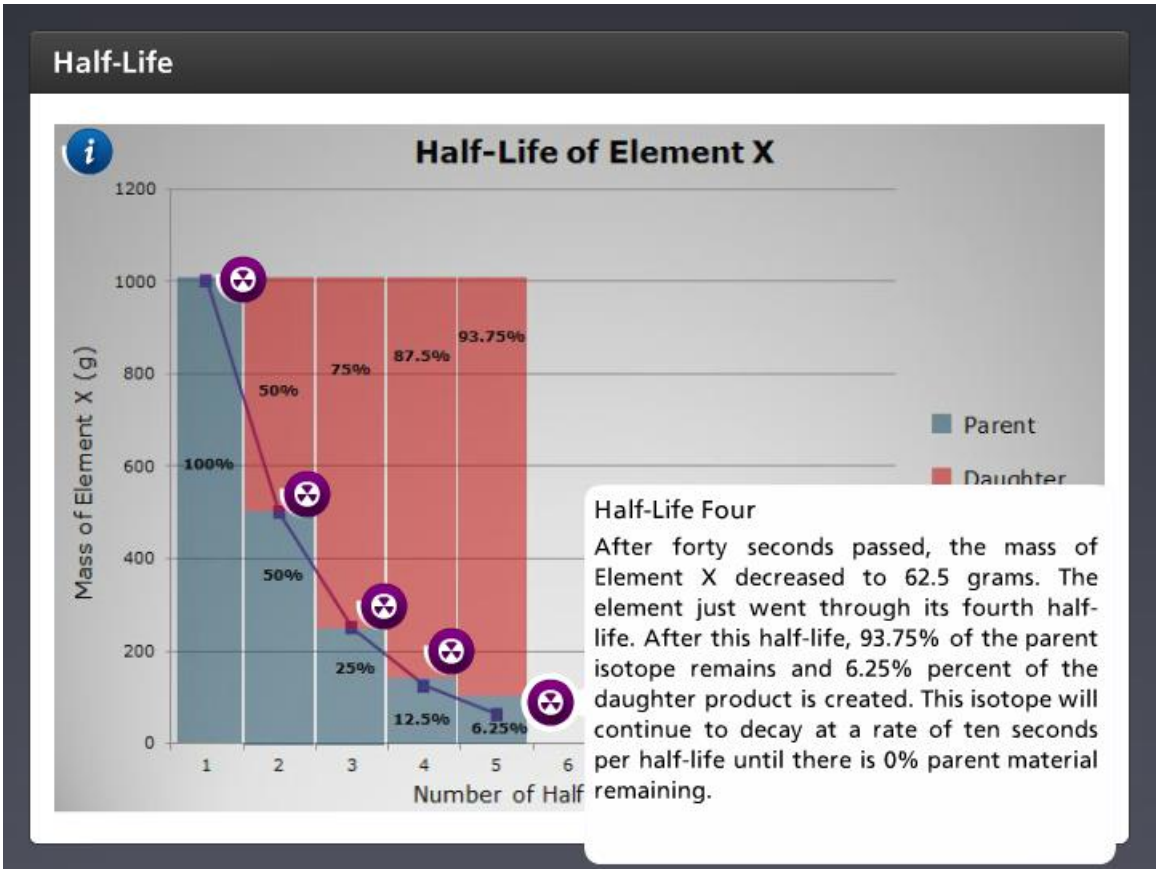
After twenty seconds passed, the mass of Element X decreased to 250.0 grams. The element just went through its second half-life. After this half-life, 75% of the parent isotope remains and 25% of the daughter product is created.

Half-Life Three



After thirty seconds passed, the mass of Element X decreased to 125.0 grams. The element just went through its third half-life. After this half-life, 87.5% of the parent isotope remains and 25% percent of the daughter product is created.

Half-Life Four



After forty seconds passed, the mass of Element X decreased to 62.5 grams. The element just went through its fourth half-life. After this half-life, 93.75% of the parent isotope remains and 6.25% percent of the daughter product is created. This isotope will continue to decay at a rate of ten seconds per half-life until there is 0% parent material remaining.