

Name _____

The Sun's Recipe: Unraveling Its Composition

Open-Ended Response Answer Key

1. Hydrogen and helium are the primary elements in the Sun's composition, making up approximately 99% of its mass. Hydrogen is crucial for nuclear fusion, as it serves as the fuel for the fusion process, while helium is formed as a result of fusion reactions. Together, they are responsible for the Sun's energy production and brightness.
2. The Sun consists of several layers, including the core, radiative zone, convective zone, and photosphere. The core is where nuclear fusion occurs. The radiative zone transports energy through electromagnetic radiation. The convective zone transports energy through the movement of hot gas. The photosphere is the visible surface of the Sun, emitting light and heat into space. Each layer has its unique characteristics and functions, contributing to the Sun's overall composition and energy production.
3. The Sun's composition and energy production play a critical role in supporting life on Earth. Its energy drives weather patterns, supports photosynthesis in plants, and influences our planet's climate. The Sun's warmth and light are essential for maintaining the conditions necessary for life on our planet.
4. In the future, the Sun will become a red giant, expanding in size and potentially engulfing some inner planets. This transformation will have significant implications for our solar system, altering the orbits and conditions of remaining planets. Eventually, the Sun will shed its outer layers and become a white dwarf, marking the end of its active phase as a star. This process highlights the cyclical nature of stars in the universe.

