

Name _____

The Mighty Sun: Our Stellar Neighbor

Open-Ended Response Answer Key

1. The Sun is considered the center of our solar system because it has the most mass and gravity, which keeps all the planets, including Earth, in orbit around it. It plays a crucial role in maintaining the stability of our planetary system by providing the gravitational force that keeps the planets in their elliptical orbits.
2. The Sun consists of several layers, including the core, radiative zone, convective zone, and photosphere. The core is where nuclear fusion occurs at temperatures of about 15 million degrees Celsius. The radiative zone transports energy through radiation, while the convective zone does so through convection currents. The photosphere is the visible surface of the Sun, emitting light and heat. Each layer has its unique characteristics and plays a role in the Sun's overall function.
3. Nuclear fusion is the process by which hydrogen atoms in the Sun's core combine to form helium, releasing an immense amount of energy in the form of light and heat. This process differs from nuclear fission, which involves the splitting of atoms to release energy. Fusion is the energy source that powers the Sun, while fission is commonly used in nuclear reactors.
4. A day without sunlight would have far-reaching consequences. Plants would struggle to photosynthesize, impacting the food chain. Temperatures would drop significantly, affecting weather patterns and potentially causing extreme cold. Solar-powered devices would cease to function, and overall, life on Earth would face numerous challenges without the Sun's energy.

