Name _____

Stellar Diversity: Exploring the Different Types of Stars

Open-Ended Response Answer Key

1. The Sun is a yellow dwarf star, smaller and cooler than a red giant. The Sun is in the middle stage of its life, while a red giant is in the later stages of its life, characterized by expansion and cooling.
2. To determine a variable star's periodicity, an astronomer would observe its brightness over time and look for recurring patterns or cycles. This information is essential for understanding the star's behavior and characteristics.
3. Challenges in studying a binary star system include distinguishing the two stars' spectra, calculating their masses, and understanding their orbital dynamics. Valuable insights may include understanding stellar evolution and the influence of one star on its companion.
4. The lifecycle of a star begins with the formation of a protostar from a dense region of gas and dust. It then progresses through the main-sequence stage, where nuclear fusion occurs. Depending on its mass, a star may become a red giant or supergiant before undergoing a supernova explosion. Afterward, the remnants may become a white dwarf, neutron star, or black hole, depending on their mass.