

Name _____

Comets: Visitors from the Cosmic Ice Realm

Open-Ended Response Answer Key

1. Comets have inspired awe and wonder throughout history, with various cultures interpreting them differently. Ancient civilizations often saw comets as omens or divine messages, sometimes predicting significant events. For example, the appearance of Halley's Comet was associated with the Norman Conquest of England in 1066. Comets continue to be sources of fascination, sparking curiosity and scientific exploration.
2. The study of comets contributes significantly to our understanding of the solar system's formation and evolution. Comets are remnants from the early solar system, preserving pristine materials from that time. By analyzing comet compositions, scientists gain insights into the conditions and materials present during the solar system's birth. Additionally, comets' movements and interactions with celestial bodies help us understand the dynamics of the solar system.
3. Future space missions to comets hold great scientific potential. Objectives may include studying a comet's nucleus, analyzing its composition, and investigating its history. Challenges include navigating the spacecraft close to the comet and collecting data amid the harsh conditions. Benefits include expanding our knowledge of comets and the early solar system.
4. A massive comet on a collision course with Earth could have catastrophic consequences, leading to massive destruction and potential extinctions. Scientists might employ strategies such as deflection missions, where spacecraft are sent to change the comet's trajectory, or mitigation efforts to reduce the impact's effects, such as evacuating vulnerable areas or preparing disaster response plans.

