

Name _____

Uranus: The Mysterious Ice Giant of the Solar System

Open-Ended Response Answer Key

1. One possible reason for Uranus's sideways rotation is a past collision with another celestial body. The significance of this rotation lies in its uniqueness; no other planet in our solar system rotates to such an extreme degree. Studying Uranus's sideways rotation helps scientists understand the dynamic and sometimes chaotic history of celestial bodies in our solar system and beyond.
2. Methane in Uranus's upper atmosphere absorbs red light and reflects blue and green light, resulting in its pale blue color. This process is similar to the way Earth's atmosphere scatters sunlight, which is why the sky appears blue. Methane molecules absorb specific wavelengths of light and reflect others, creating the characteristic coloration seen on Uranus.
3. Exploring Uranus is important because it allows us to gain a deeper understanding of ice giants, a class of planets that includes Uranus and Neptune. Studying Uranus can provide insights into planetary formation, evolution, and atmospheric processes that differ from gas giants like Jupiter and Saturn. Additionally, it can help us learn more about the history and dynamics of our solar system.
4. A future space mission to Uranus might aim to study the planet's atmosphere, its magnetic field, its rings, and its moons. Scientific goals could include understanding the composition and structure of the atmosphere, investigating the planet's magnetic field and its unusual rotation, and exploring the rings and moons for clues about their origins and evolution. Such a mission could significantly advance our knowledge of ice giants, planetary dynamics, and the broader processes at play in our solar system.

