

Name _____

Exploring the Mysterious World of Mercury

Open-Ended Response Answer Key

1. As an astronaut on Mercury, I would face challenges such as extreme temperature variations between day and night, ranging from scorching heat to frigid cold. I would also experience difficulty moving due to Mercury's low gravity. To adapt, I would require a specially designed suit and habitat to regulate temperature, provide oxygen, and protect against radiation. Mobility would be aided by advanced suits and vehicles designed for low-gravity environments.
2. The Caloris Basin is believed to be the result of a massive asteroid or comet impact early in Mercury's history. The impact created a vast basin with concentric rings. The energy released from the impact caused the planet's surface to fracture on the opposite side, forming large cliffs called "scarps." Some scientists also suggest that the impact may have caused volcanic activity in the area.
3. Both Mercury and the Moon are rocky bodies in our solar system with similar surface features such as craters, cliffs, and plains. However, Mercury is larger than the Moon, about the size of Earth's moon. Mercury has a thin atmosphere, while the Moon has none. Mercury has a magnetic field, but the Moon does not. Unlike the Moon, Mercury experiences extreme temperature variations due to its thin atmosphere. Both bodies have been heavily cratered, indicating a history of impacts.
4. Future missions to Mercury could provide valuable insights into its geological history, magnetic field, and the presence of water ice. Scientists could further study the planet's surface features, including the Caloris Basin and scarps. Challenges for astronauts visiting Mercury would include managing extreme temperature fluctuations, adapting to low gravity, and ensuring life support systems can operate in the harsh environment. Extended stays on Mercury would require advanced technologies and careful planning to address these challenges.

