

Name \_\_\_\_\_

## Unlocking the Mystery: How Vast Is the Universe?

### Open-Ended Response Answer Key

1. Possible Answer: The "observable universe" refers to the part of the universe that we can see from Earth. It's important to distinguish between the observable universe and the entire universe because the observable universe is what we can study and observe, while the entire universe, which may be much larger, remains a mystery. The distinction helps us understand the limits of our current knowledge and the vastness of what we have yet to explore.
2. Possible Answer: The Cepheid variable method involves observing stars that pulsate at a rate related to their brightness. By measuring the pulsation period and comparing it to their apparent brightness, astronomers can calculate their distances. This method is valuable because it allows us to create a cosmic distance ladder, which is essential for determining the size and scale of the universe. It helps us map the universe and understand its structure.
3. Possible Answer: The expanding universe implies that galaxies are moving away from each other, suggesting that the universe is growing larger over time. This challenges the idea of a static and unchanging universe. It also reminds us that we are just a tiny part of a vast and evolving cosmos, raising questions about the existence of other life forms and our potential to explore distant regions of the universe. This discovery has fundamentally altered our understanding of the universe's history and future.

