

Name _____

Can We See Black Holes, or Are They Invisible?

Open-Ended Response Answer Key

1. To determine if there is a black hole in the star system with irregular orbits, I would continue observing the motion of nearby stars over a longer period. If the irregularities persist and cannot be explained by the known objects in the system, it could suggest the presence of a black hole. Characteristics of the black hole, such as its mass, could be inferred from the extent of the irregularities in the stars' orbits.
2. Future developments in black hole research may involve the use of more advanced telescopes and imaging techniques, allowing for even clearer images and data about black holes. Additionally, advancements in theoretical physics may help us better understand the nature of black holes, including the behavior of matter and energy near the event horizon and singularity.
3. Imagine a black hole as if it were a super-dense, invisible object in space, sort of like a hidden giant magnet. Just as a powerful magnet can attract metal objects from a distance, a black hole's gravity can pull in everything around it, including light. It's like a cosmic vacuum cleaner!
4. Capturing an image of a black hole for the first time was an incredible achievement both emotionally and scientifically. Emotionally, it felt like solving a cosmic puzzle and provided a sense of wonder about the universe. Scientifically, it confirmed the existence of black holes, deepening our understanding of astrophysics and gravity. It also opened up new possibilities for studying these mysterious objects in greater detail.

