

Name \_\_\_\_\_

## What Is A Supermassive Black Hole?

### Open-Ended Response Answer Key

1. Answers will vary but may include descriptions of using instruments like radio telescopes and infrared detectors to study the Milky Way's supermassive black hole. They would measure the orbits of stars near the black hole and assess its impact on the galaxy's structure.
2. The consequences of an active supermassive black hole include the emission of powerful jets of particles and radiation. This activity can affect the surrounding galaxy by heating the gas, suppressing star formation, and influencing the distribution of matter.
3. Supermassive black holes can affect galaxy evolution by regulating star formation rates. When active, they can release energy that heats surrounding gas, inhibiting the formation of new stars and affecting the distribution of existing stars.
4. Answers will vary but could include comparing a supermassive black hole to a cosmic "swirl" that draws in matter or to a "cosmic librarian" that organizes the stars and gas within a galaxy. Analogies can help convey the role and significance of supermassive black holes in the universe.

