

Name \_\_\_\_\_

## Gravity Unveiled: Can It Exist Without Mass?

### Short Answer Key

1. Massless particles can be influenced by gravity because gravity is not determined by the mass of the particle itself but by the presence of mass in the surrounding spacetime. Massive objects, like stars and planets, create curved spacetime, causing massless particles to follow curved trajectories as if they were experiencing gravitational attraction.
2. Albert Einstein's theory of general relativity proposed that gravity is the result of the bending or warping of spacetime by mass and energy, rather than a force between masses, as described by Newton. In Einstein's theory, massive objects create curves in spacetime, affecting the motion of other objects in their vicinity.
3. No, an object with mass cannot be completely shielded from gravity's influence. Gravity is a fundamental force of nature that affects all objects with mass, regardless of barriers or shields. However, the strength of gravity's influence can be reduced by increasing the distance from massive objects or by employing advanced technologies.
4. The understanding that gravity depends on the presence of mass explains why we stay grounded on Earth. Earth's mass creates a gravitational field that exerts a force on all objects with mass, regardless of barriers or shields. This force keeps us attracted to the Earth's surface, giving us weight and making it difficult to leave the planet's gravitational influence.

