Name _____

What Happens When an Object Falls into a Black Hole?

Short Answer Key

1. The event horizon of a black hole is the boundary beyond which nothing can escape, not even light. It is significant because it marks the point of no return for any object falling into the black hole's gravitational pull.
2. Spaghettification is the stretching and elongation of an object as it gets closer to a black hole due to extreme tidal forces. These forces are caused by the difference in gravitational pull on the side facing the black hole compared to the side farther away.
3. Time dilation affects an object falling into a black hole by causing time to slow down for the falling object compared to external observers. This means that while the falling object experiences a shorter journey, external observers see it appear to slow down and freeze near the event horizon due to the black hole's intense gravity.
4. Beyond the event horizon of a black hole lies the singularity, which is a point of infinite density at the black hole's core. At the singularity, our current understanding of physics breaks down, and the fabric of spacetime becomes distorted beyond comprehension. It is a place where the laws of physics as we know them cease to apply.
5. The concept of spaghettification is fascinating because it illustrates the extreme and bizarre effects of a black hole's gravity on objects. It's intimidating because it represents the destructive forces that can tear apart any matter falling into a black hole, highlighting the immense power of these cosmic entities.