

Name _____

Albert Einstein: Unraveling the Mysteries of the Universe

Short Answer Key

1. Albert Einstein was born on March 14, 1879, in Ulm, Germany. He displayed an early curiosity and fascination with mathematics and science. However, his unconventional thinking and reluctance to conform to traditional schooling methods often clashed with his teachers. Despite these challenges, Einstein pursued his passion for physics and mathematics. He attended the Swiss Federal Polytechnic in Zurich, where he graduated in 1900. After graduation, he worked as a patent examiner at the Swiss Patent Office, where he developed his groundbreaking theories in physics.
2. Albert Einstein's theory of special relativity introduced two key concepts. First, it stated that the laws of physics are the same for all observers, regardless of their motion, as long as they are not accelerating. This challenged classical mechanics, which believed that space and time were absolute. Second, he introduced the equation $E=mc^2$, which demonstrated the equivalence of energy (E) and mass (m) with the speed of light (c) as the constant of proportionality. This equation showed that mass and energy were interchangeable and had profound implications for nuclear energy.
3. Einstein's equation $E=mc^2$ states that energy (E) is equal to mass (m) times the speed of light (c) squared. This equation demonstrated the equivalence of energy and mass, implying that mass could be converted into energy and vice versa. It had a significant impact on our understanding of energy production, particularly in the development of nuclear energy, and led to advances in nuclear physics and technology.
4. Einstein's theory of general relativity changed our understanding of gravity by describing it as the curvature of space and time caused by the presence of mass and energy. In this theory, objects follow curved paths in the presence of massive objects, such as planets or stars, due to the curvature of space-time. This replaced Isaac Newton's classical law of universal gravitation, which described gravity as a force. Experimental evidence supporting general relativity included the bending of starlight observed during a solar eclipse in 1919.
5. Albert Einstein's work has had a lasting legacy on modern physics and cosmology. His theories of relativity revolutionized our understanding of space, time, and gravity. They paved the way for further developments in physics, including the study of black holes, the expansion of the universe, and the search for a unified theory of everything. Einstein's equation $E=mc^2$ underpins nuclear physics and has both peaceful and destructive applications. His work continues to inspire scientists and researchers worldwide.

