

Name: _____ Date: _____

Shatter Classic Limits: A 10th Grade Modern Physics Quiz

Examine how GPS timing and LED technology rely on the strange mechanics of the subatomic world in this foundational assessment of post-Newtonian concepts.

1. Which constant is the fundamental 'speed limit' of the universe that remains the same for all observers, regardless of their own motion?

- A. The speed of sound
- B. The acceleration of gravity (9.8 m/s^2)
- C. The speed of light in a vacuum
- D. The Earth's orbital velocity

2. True or False: In modern physics, gravity is described as the physical 'curving' or warping of the fabric of space and time.

- A. True
- B. False

3. The _____ principle suggests that we cannot simultaneously know the exact position and the exact momentum of a subatomic particle.

- A. Einstein
- B. Newtonian
- C. Heisenberg
- D. Relativity

4. What does the 'm' stand for in Einstein's famous energy-mass equivalence equation, $E=mc^2$?

- A. Momentum
- B. Mass
- C. Motion
- D. Magnitude

5. In the world of the very small, light sometimes behaves like a continuous wave and other times like a stream of distinct particles called _____.

- A. Electrons
- B. Protons
- C. Photons
- D. Neutrons

6. True or False: According to Special Relativity, if you traveled near the speed of light, time would pass more slowly for you than for someone staying on Earth.

- A. True
- B. False

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7. Quantum mechanics is the study of physics at the scale of _____.

- A. Galaxies
- B. Atoms
- C. Ocean currents
- D. Human cells

8. Which modern technology relies on adjusting for both the speed of satellites and the Earth's gravity to provide accurate location data?

- A. AM Radio
- B. Internal combustion engines
- C. GPS (Global Positioning System)
- D. Mercury thermometers

9. True or False: The 'Photoelectric Effect' is the principle that explains how solar panels convert sunlight into electricity.

- A. True
- B. False

10. A _____ is an extremely dense region of space where gravity is so strong that even light cannot escape.

- A. White Dwarf
- B. Black Hole
- C. Nebula
- D. Red Giant