

Name: _____ Date: _____

Stardust Architects: 3rd Grade Modern Physics Inquiry

Third graders design invisible worlds while analyzing how subatomic building blocks and light speed change our reality.

1. Imagine you are building a 'Quantum Playground.' If atoms are like a huge stadium, how big would the tiny center (the nucleus) be compared to the rest of the empty space?

- A. A tiny marble in the middle of the field
- B. A giant bouncy castle filling the seats
- C. The same size as the whole stadium
- D. A blanket covering all the grass

2. When things move incredibly fast—almost as fast as a beam of light—time actually begins to _____, making a clock on a spaceship tick slower than one on Earth.

- A. speed up
- B. stretch out
- C. turn blue
- D. stop forever

3. In the world of the very small (Quantum Mechanics), a particle can act like both a tiny solid ball and a wavy ripple in a pond at the same time.

- A. True
- B. False

4. If you could place a heavy bowling ball on a stretchy trampoline, it curves the fabric downward. In Modern Physics, this is how we describe ____.

- A. How magnets pull together
- B. How light changes color
- C. How gravity warps space
- D. How sound travels in air

5. A special machine called an MRI uses powerful magnets and _____ physics to look inside the human body without using surgery.

- A. dinosaur
- B. volcano
- C. quantum
- D. weather

6. Even if you had the most powerful engine in the universe, it is impossible to travel faster than the speed of light.

- A. True

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B. False

7. Imagine a cat in a box that is both 'happy' and 'grumpy' until you open the lid to check. This paradox helps scientists explain that subatomic particles ____.

- A. Can be in two states at once until measured
- B. Are always invisible to the human eye
- C. Disappear when they get bored
- D. Only exist when we are sleeping

8. Solar panels on a roof work because of the ____ effect, where light hitting a surface 'knocks' electrons loose to create electricity.

- A. photoelectric
- B. echo-location
- C. butterfly
- D. rainbow

9. A 'Black Hole' is a place in space where gravity is so weak that objects float away into nothingness.

- A. True
- B. False

10. In the future, we might use 'Entanglement' to send messages instantly. This means two particles are linked so that ____.

- A. They both turn into gold
- B. What happens to one happens to the other, no matter the distance
- C. They repel each other like angry magnets
- D. They grow larger the further apart they are