

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Science Multiverse: 11th Grade Interdisciplinary Challenge

Synthesize complex data across thermodynamics, genomics, and plate tectonics to prove your expertise in how the major scientific disciplines intersect.

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**1. A researcher is utilizing CRISPR-Cas9 to modify the genome of a thermophilic archaea species to investigate its metabolic efficiency. This study primarily bridges which two sub-disciplines?**

- A. Molecular Biology and Thermodynamics
- B. Organic Chemistry and Glaciology
- C. Ecology and Theoretical Physics
- D. Astrophysics and Botany

**2. The study of the chemical signatures left by prehistoric life in sedimentary rock layers is known as \_\_\_\_\_, a field combining Earth Science and Chemistry.**

- A. Geochemistry
- B. Biogeochemistry
- C. Cryogenics
- D. Petrology

**3. Quantum Mechanics is a sub-branch of Physics that is negligible when explaining the behavior of electrons in covalent bonding within the field of Chemistry.**

- A. True
- B. False

**4. When an environmental scientist analyzes the isotopic ratios of oxygen in ice cores to determine paleoclimatic temperatures, they are applying which branch of science?**

- A. Marine Biology
- B. Classical Mechanics
- C. Geology (Earth Science)
- D. Sociology

**5. The investigation of the Redshift of distant galaxies to determine the rate of universal expansion is a primary focus of \_\_\_\_\_.**

- A. Astrophysics
- B. Quantum Physics
- C. Meteorology
- D. Nuclear Physics

**6. Biological systems are considered 'closed systems' that operate independently of the second law of thermodynamics.**

- A. True

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B. False

**7. Which field would be most concerned with the role of plate tectonics in determining the biodiversity of isolated island chains over millions of years?**

- A. Fluid Dynamics
- B. Evolutionary Geology
- C. Organic Chemistry
- D. Materials Science

**8. If a technician is testing the tensile strength of a new carbon-nanotube polymer for use in bridge construction, they are working in \_\_\_\_\_.**

- A. Materials Science
- B. Genomics
- C. Zoology
- D. Atmospheric Science

**9. The study of the impact of ocean acidification on coral calcification rates involves a synthesis of Marine Biology and Chemistry.**

- A. True
- B. False

**10. A scientist studying the nucleosynthesis of heavy elements during a supernova event is primarily engaging with which fields?**

- A. Botany and Earth Science
- B. Nuclear Physics and Astronomy
- C. Anatomy and Physiology
- D. Entomology and Ecology