

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

## When Scientific Disciplines Collide: A 10th Grade Cross-Examination

Sophomores analyze interdisciplinary scenarios to distinguish between pure and applied sciences while evaluating the boundaries of modern inquiry.

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**1. A researcher is studying how the high pressure at the bottom of the Mariana Trench affects the molecular structure of proteins in deep-sea fish. Which two branches of science are primarily being integrated here?**

- A. Astronomy and Chemistry
- B. Physics and Biology
- C. Earth Science and Botany
- D. Environmental Science and Geology

**2. The study of the chemical composition of rocks to understand the early formation of the Earth's crust is specifically known as \_\_\_\_\_.**

- A. Geochemistry
- B. Astrophysics
- C. Paleontology
- D. Organic Chemistry

**3. Theoretical physics relies more on mathematical modeling and conceptual frameworks than on direct laboratory experimentation.**

- A. True
- B. False

**4. If a scientist is investigating the potential for life on Enceladus (a moon of Saturn) by analyzing its subsurface ocean, which specialized field are they practicing?**

- A. Meteorology
- B. Astrobiology
- C. Marine Biology
- D. Quantum Mechanics

**5. In the hierarchy of science, the study of how energy transformations occur within a closed mechanical system is a core concern of \_\_\_\_\_.**

- A. Thermodynamics
- B. Genetics
- C. Cytology
- D. Ecology

**6. Environmental Science is considered an 'applied science' because it uses knowledge from various pure sciences to solve real-world problems.**

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- A. True
- B. False

**7. A scientist analyzing the radioactive decay of isotopes within a meteorite to determine the age of the solar system is acting as a(n):**

- A. Evolutionary Biologist
- B. Cosmochemist
- C. Ecologist
- D. Botanist

**8. The branch of Earth Science that focuses specifically on the Earth's atmosphere and the processes that cause weather is \_\_\_\_\_.**

- A. Oceanography
- B. Seismology
- C. Meteorology
- D. Hydrology

**9. Organic Chemistry is the study of all chemical compounds, regardless of whether they contain carbon-hydrogen bonds.**

- A. True
- B. False

**10. Which field would be most concerned with the ethical implications and biological mechanics of CRISPR gene-editing technology?**

- A. Particle Physics
- B. Geophysics
- C. Molecular Biology
- D. Analytical Chemistry