

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

## Paleo-Puzzles & Tectonic Tacos: High School Geosphere Quiz

Calculate isotopic decay curves and analyze faunal succession to reconstruct Earth's complex tectonic and biological timeline.

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**1. Using the principle of faunal succession, if a geologist discovers a layer containing the graptolite 'Monograptus' globally, what does this imply about the sediment layer?**

- A. It represents a localized paleoenvironment with high turbidity.
- B. It can be used as a chronostratigraphic marker to correlate distant strata.
- C. The layer must be younger than the first появления of angiosperms.
- D. The sediment was deposited during the Neogene Period.

**2. The Great Oxygenation Event (GOE) can be detected in the rock record primarily through the presence of Banded Iron Formations (BIFs).**

- A. True
- B. False

**3. In radiometric dating, if a zircon crystal contains 25% of the parent isotope Uranium-235 and 75% of the daughter Lead-207, how many half-lives have passed?**

- A. Half of one half-life
- B. One half-life
- C. Two half-lives
- D. Three half-lives

**4. Which of the following geochemical signatures would most likely indicate a massive volcanic excursion at the Permian-Triassic boundary?**

- A. High concentrations of Iridium in clay layers
- B. A significant negative carbon isotope excursion in marine carbonates
- C. A sudden increase in the ratio of Oxygen-18 to Oxygen-16
- D. The appearance of diverse scleractinian coral reefs

**5. The Ediacaran Biota represent the earliest known complex multicellular organisms, preceding the 'Cambrian Explosion'.**

- A. True
- B. False

**6. The presence of \_\_\_\_\_ in the record of the Appalachian Mountains provides evidence of the closure of the Iapetus Ocean during the Paleozoic.**

- A. Ophiolites
- B. Glacial striations
- C. Stromatolites

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D. Amber

**7. What is the significance of the 'Lagerstätte' sites, such as the Burgess Shale, in understanding Earth's history?**

- A. They contain only the largest megafauna of the Mesozoic.
- B. They provide exceptional preservation of soft-bodied organisms usually lost to decay.
- C. They are the only places where radioactive isotopes can be found.
- D. They indicate areas where tectonic subduction has never occurred.

**8. A disconformity is an erosional surface that separates parallel layers of sedimentary rock.**

- A. True
- B. False

**9. Based on the concept of 'Punctuated Equilibrium' in the fossil record, evolutionary change is characterized by \_\_\_\_\_.**

- A. Constant, slow accumulation of small traits over billions of years
- B. Long periods of stasis interrupted by brief periods of rapid change
- C. Horizontal gene transfer between unrelated phyla
- D. The immediate extinction of all species during environmental shifts

**10. Which paleoclimate proxy would be most effective for determining atmospheric CO<sub>2</sub> levels 400 million years ago?**

- A. Stomatal density on fossilized leaves
- B. Dendrochronology (tree ring analysis)
- C. Direct measurement of air bubbles in Antarctic ice cores
- D. The depth of modern river deltas