

Name: _____ Date: _____

Geologic Deep Time Analysis for 11th Grade

Isotope geochemistry, floral succession, and faunal turnover. High-level synthesis of Earth's stratigraphic record and paleoenvironmental reconstruction.

1. The Great Oxygenation Event (GOE) approximately 2.4 billion years ago is primarily evidenced in the rock record by which geological feature?

- A. Extensive coal beds from lycopsid forests
- B. Banded Iron Formations (BIFs) containing hematite and magnetite
- C. The sudden appearance of angiosperm pollen in stratigraphic layers
- D. High concentrations of iridium in the K-Pg boundary layer

2. In the context of biostratigraphy, an ideal ____ is an organism that was geographically widespread, abundant, and existed for a short geological duration.

- A. Trace fossil
- B. Lagerstätte
- C. Index fossil
- D. Facies fossil

3. The use of Carbon-14 dating is an effective method for determining the absolute age of Ediacaran fauna preserved in sandstone.

- A. True
- B. False

4. Which transition in the fossil record best illustrates the move from gymnosperm-dominated ecosystems to the rise of flowering plants during the Cretaceous?

- A. The diversification of Glossopteris in Gondwana
- B. The proliferation of Archaeopteris in the Devonian
- C. The radiation of Angiosperms and associated insect pollinators
- D. The dominance of Stromatolites in shallow marine environments

5. The 'Signor-Lipps effect' refers to the risk of misinterpreting the fossil record due to ____, which can make a mass extinction appear more gradual than it truly was.

- A. Radioactive decay
- B. Incomplete sampling
- C. Continental drift
- D. Tectonic subduction

6. Oxygen isotope ratios (O-18 vs O-16) found in the calcium carbonate shells of Foraminifera fossils are used by paleoclimatologists to reconstruct ancient global temperatures.

- A. True

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B. False

7. The Devonian Period is often referred to as the 'Age of Fishes,' but it also witnessed which critical terrestrial milestone?

- A. The first appearance of mammals
- B. The formation of the first complex forest ecosystems
- C. The colonization of land by prokaryotes
- D. The breakup of the supercontinent Pangea

8. Analyzing the ____ of fossilized leaves, such as those from the Ginkgo tree, allows scientists to estimate atmospheric CO₂ levels from millions of years ago.

- A. Stomatal density
- B. Chlorophyll content
- C. Petal count
- D. Root length

9. What does the presence of 'dropstones' in ancient marine sedimentary layers typically indicate about the environment at that time?

- A. High-velocity volcanic eruptions
- B. Intense desertification and wind-blown debris
- C. The presence of icebergs during a glacial period
- D. Submarine landslides in tropical zones

10. A Lagerstätte is a geological deposit that exhibits extraordinary fossil preservation, often including soft tissues that are usually lost to decay.

- A. True
- B. False