

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

## Answer Key: Jurassic Park Noir: 8th Grade Deep Crust Forensic Quiz

Evaluate isotopic signatures and faunal succession to reconstruct tectonostratigraphic history. Analysis centers on correlating disconformities with mass extinctions.

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**1. A geologist identifies a layer of bentonite (volcanic ash) sandwiched between two limestone strata containing different species of brachiopods. What is the most rigorous way to determine the absolute age of these fossils?**

**Answer:** B) Calculate the ratio of Parent to Daughter isotopes in the ash layer's zircon crystals

Radiometric dating of volcanic ash provides a high-precision 'absolute' date for the stratum, whereas superposition and index fossils only provide 'relative' ages.

**2. The 'Lazarus effect' in the fossil record refers to a taxon that disappears during a mass extinction event only to reappear much later in higher strata.**

**Answer:** A) True

The Lazarus effect describes gaps in the fossil record where a lineage seems extinct due to poor preservation or localized habitat loss, but successfully survived elsewhere.

**3. If you discover a 'Biozone' overlap of Globigerinoides and Discoaster organisms in a deep-sea core, you are using the principle of \_\_\_ to narrow the geologic window.**

**Answer:** A) Faunal Succession

The Principle of Faunal Succession (or Biostratigraphy) uses the predictable order of fossil appearances and disappearances to correlate and date rock units.

**4. Analyzing stable oxygen isotopes ( $^{18}\text{O}/^{16}\text{O}$ ) within the calcium carbonate shells of Foraminifera fossils allows scientists to reconstruct which specific variable?**

**Answer:** C) Paleo-ocean temperatures and glacial ice volume

Isotopic fractionation is temperature-dependent; higher  $^{18}\text{O}$  concentrations in shells typically indicate cooler climates and larger polar ice caps.

**5. An 'Angular Unconformity' represents a continuous, uninterrupted depositional environment without any tectonic disturbance.**

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**Answer:** B) False

Angular unconformities signify a major gap in the timeline where older rocks were tilted or folded, eroded, and then covered by newer, horizontal layers.

**6. The 'Burgess Shale' is a famous Lagerstätte because it contains exceptionally preserved fossils of soft-bodied organisms from the \_\_\_ Period.**

**Answer:** B) Cambrian

The Cambrian Explosion is best documented in the Burgess Shale, detailing the rapid diversification of complex animal body plans roughly 508 million years ago.

**7. Which scenario best describes a 'Disconformity' in the stratigraphic record?**

**Answer:** C) Parallel sedimentary layers are separated by an erosional surface signifying a time gap

A disconformity is a type of unconformity where the layers are parallel but there is a clear evidence of an erosional break in the timeline.

**8. Carbon-14 dating is the most effective method for determining the age of a T-Rex femur found in Mesozoic strata.**

**Answer:** B) False

Carbon-14 has a half-life of only 5,730 years; it is useless for objects older than ~50,000 years. Dinosaurs died out 66 million years ago.

**9. The transition from the Paleozoic Era to the Mesozoic Era was marked by the \_\_\_ extinction, the most severe in Earth's history.**

**Answer:** C) Permian-Triassic

The 'Great Dying' occurred at the end of the Permian, eliminating approximately 96% of marine species and 70% of terrestrial vertebrate species.

**10. How does the discovery of Glossopteris flora across South America, Africa, India, and Antarctica provide evidence for plate tectonics?**

**Answer:** D) The heavy, non-buoyant seeds imply these landmasses were once a contiguous supercontinent

The distribution of Glossopteris was a key piece of evidence for Wegener's Continental Drift theory, as the seeds were too heavy to be wind-dispersed or survive ocean transit.

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