Name: _____ **Date:** _____

Answer Key: Deep Time Detectives: An 8th Grade Fossils & Stratigraphy Quiz

Imagine reconstructing a lost world using only index fossils and radioactive isotopes to bridge billions of years in the geologic record.

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1. If a geologist finds a layer of volcanic ash between two sedimentary rock layers, they can use it to determine the numerical age of those layers. This technique is known as:

Answer: B) Absolute dating

Absolute dating (or radiometric dating) uses the decay of isotopes in materials like volcanic ash to assign a specific numerical age in years, whereas relative dating only determines if one layer is older than another.

2. The sudden appearance of diverse animal phyla in the fossil record roughly 541 million years ago is a critical event called the _____ Explosion.

Answer: C) Cambrian

The Cambrian Explosion marks a rapid expansion in the complexity and variety of life forms, moving away from the simpler organisms of the Precambrian.

3. An unconformity represents a 'gap' in the geologic record where rock layers were either never deposited or were eroded away before new layers formed.

Answer: A) True

Unconformities are breaks in the geologic record that indicate periods of erosion or non-deposition, meaning the history of that specific timeframe is missing from the rock sequence.

4. Why are certain fossils, like ammonites, considered excellent 'index fossils' for correlating rock layers across different continents?

Answer: C) They were geographically widespread and existed for a short geologic time.

To be an index fossil, an organism must be easily identifiable, lived in many places globally, but inhabited Earth for a relatively short, specific period of time.

5. The Law of _____ states that in an undisturbed sequence of sedimentary rocks, each layer is older than the one above it and younger than the one below it.

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Answer: C) Superposition

Superposition is a fundamental principle of stratigraphy used to determine the relative ages of sedimentary rock layers based on their vertical position.

6. Carbon-14 dating is the most effective method for determining the age of dinosaur bones from the Jurassic Period.

Answer: B) False

Carbon-14 has a short half-life (about 5,730 years) and is only useful for dating organic remains up to about 50,000 years old; dinosaur fossils are millions of years old and require isotopes like Uranium-238.

7. Which boundary in the geologic time scale is marked by the largest mass extinction in Earth's history, often called the 'Great Dying'?

Answer: B) The Permian-Triassic boundary

The Permian-Triassic extinction event resulted in the loss of about 96% of marine species and 70% of terrestrial vertebrate species, making it the most severe extinction event known.

8. Coprolites and gastroliths are examples of _____ fossils because they provide evidence of an organism's behavior or diet rather than its body structure.

Answer: C) Trace

Trace fossils (ichnofossils) record the activities of organisms, such as footprints (tracks), burrows, or fossilized waste (coprolites), providing ecological context.

9. What does the discovery of Glossopteris (ancient fern) fossils in Antarctica, South America, and Africa primarily suggest to scientists?

Answer: B) These continents were once part of a single landmass called Gondwana.

The distribution of identical fossils across disparate continents is a key piece of evidence for plate tectonics and the past existence of supercontinents.

10. Petrifaction occurs when the internal cavities and cell walls of an organism are filled or replaced by mineral-rich water that turns to stone.

Answer: A) True

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Petrifaction, or permineralization, involves minerals like silica or calcite precipitating into the pore spaces of tissues (like wood or bone), preserving the internal structure.