Name: _____ **Date:** _____

Answer Key: Chrono-Quest: Decoding the 11th Grade Fossil Record

Biostratigraphy, carbon dating, and faunal succession—the essential tools used by geologists to reconstruct Earth's biological timeline.

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1. Which principle suggests that in an undisturbed sequence of sedimentary rocks, each layer is older than the one above it?

Answer: C) The Principle of Superposition

The Principle of Superposition is a fundamental concept in relative dating used to determine the chronological order of rock layers.

2. Petrification occurs when minerals from groundwater seep into the organic tissues of an organism and crystallize, effectively turning it to stone.

Answer: A) True

Petrification (or permineralization) is a common fossilization process where mineral-rich water fills the pores of bones or wood.

3. A fossil that is widely distributed, lived for a short period of geological time, and is used to define geologic periods is known as a(n) _____ fossil.

Answer: B) Index

Index fossils are essential for biostratigraphy because they allow geologists to match rock layers of the same age across different locations.

4. Which geological era is often referred to as the 'Age of Mammals' due to the rapid diversification of mammalian species following the K-Pg extinction?

Answer: C) Cenozoic

The Cenozoic Era spans from 66 million years ago to the present and is characterized by the rise of mammals and birds.

5. Carbon-14 dating is the most effective method for determining the age of dinosaur fossils from the Jurassic period.

Answer: B) False

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Carbon-14 has a short half-life and is only useful for dating organic materials up to about 50,000 years old, whereas dinosaur fossils are millions of years old.

6. What type of fossilization occurs when a thin film of carbon residue is left behind after the more volatile components of an organism decay?

Answer: A) Carbonization

Carbonization is often seen in plant fossils and delicate insects, leaving a high-contrast dark image of the organism on rock.

7. The _____ extinction event, which occurred approximately 252 million years ago, was the most severe in Earth's history, wiping out nearly 96% of marine species.

Answer: C) Permian

The Permian-Triassic extinction event marks the boundary between the Paleozoic and Mesozoic Eras and was caused by massive volcanic activity.

8. Coprolates and fossilized footprints are categorized as which type of fossil?

Answer: B) Trace Fossils

Trace fossils (ichnofossils) record the activity or behavior of an organism rather than its physical body.

9. The Great Oxygenation Event was triggered by the evolution of photosynthetic cyanobacteria during the Precambrian.

Answer: A) True

Cyanobacteria produced oxygen as a byproduct of photosynthesis, which eventually accumulated in the atmosphere and changed the course of Earth's history.

10. The appearance of many phyla of animals in a relatively short period of geologic time is known as the _____ Explosion.

Answer: C) Cambrian

The Cambrian Explosion (approx. 541 million years ago) represents a pivotal moment when complex, multicellular life diversified rapidly.