

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

## Answer Key: Unearth Your Legacy: 9th Grade Geologic Chronology Quiz

Synthesize geochemical dating methods and bio-stratigraphic correlation techniques for advanced high school earth science review or summative assessment.

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**1. Which analytical method allows geologists to correlate sedimentary strata across different continents despite variations in local lithology?**

**Answer:** A) Palynology and the study of microfossil assemblages

Palynology (the study of pollen/spores) and microfossils are widely distributed by wind and currents, providing global 'time markers' that transcend local rock types.

**2. The sudden appearance of diverse multicellular organisms in the rock record at the start of the Phanerozoic eon is known as the \_\_\_\_\_.**

**Answer:** B) Cambrian Explosion

The Cambrian Explosion marks the rapid diversification of animal phyla, transitioning Earth from microbial dominance to complex skeletal ecosystems.

**3. True or False: Index fossils are most effective for relative dating if the organism existed globally for a narrow duration of geologic time.**

**Answer:** A) True

High-quality index fossils must be geographically widespread to allow correlation and short-lived to provide precise chronological resolution.

**4. If a zircon crystal contains 25% of its original Uranium-235 (parent) and 75% Lead-207 (daughter), how many half-lives have elapsed since the crystal formed?**

**Answer:** B) Two half-lives

After one half-life, 50% remains; after two half-lives, 25% remains. This radiometric dating allows for the absolute age determination of igneous rocks.

**5. A geological feature such as a fault or igneous intrusion that cuts through another body of rock is younger than the rock it cuts, according to the \_\_\_\_\_.**

**Answer:** C) Principle of Cross-Cutting Relationships

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The cross-cutting principle is essential for establishing the relative sequence of tectonic and volcanic events in a region's history.

**6. Why is the discovery of *Glossopteris* flora across South America, Africa, India, and Antarctica considered evidence for Plate Tectonics rather than just seed dispersal?**

**Answer:** A) The seeds were too heavy to be carried by wind or salt water across oceans.

The heavy, non-buoyant nature of *Glossopteris* seeds supports the theory that these continents were once part of a continuous landmass, Gondwana.

**7. True or False: An unconformity in the rock record represents a period of continuous sediment deposition without any erosional intervals.**

**Answer:** B) False

Unconformities represent 'missing time' caused by erosion or non-deposition, indicating a break in the geological record.

**8. The widespread iridium layer found at the K-Pg boundary globally is primarily interpreted as evidence for what event?**

**Answer:** C) An extra-terrestrial impact from an asteroid or comet

Iridium is rare in Earth's crust but abundant in asteroids; its global distribution at the K-Pg boundary supports the impact theory of the end-Cretaceous extinction.

**9. Which specific preservation mode involves the internal cavity of a shell filling with sediment that later hardens, even if the original shell dissolves?**

**Answer:** C) Internal Mold/Cast

Molds and casts preserve the three-dimensional morphology of an organism even when the original organic material and shell are long gone.

**10. True or False: The Hadean Eon is characterized by an extensive fossil record of the first eukaryotic cells.**

**Answer:** B) False

The Hadean Eon predates the known origin of life; Earth was still cooling and forming its crust, leaving no fossil evidence of eukaryotes.