

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

## Answer Key: Sifting Sand and Stone: 12th Grade Fossil Chronology Quiz

Scholars identify the chemical fingerprints and physical markers of deep time preserved in isotopic ratios and index fossils like the Burgess Shale fauna.

---

**1. Which of these specialized fossils serves as an 'index fossil' for the Cambrian Period due to its rapid evolution and wide distribution?**

**Answer:** C) Paradoxides (Trilobite)

Trilobites like Paradoxides are exceptional index fossils because they existed for a specific, short geologic time and are found globally in sedimentary layers.

**2. The Law of Superposition states that in an undisturbed sequence of rocks, the oldest layers are found at the bottom.**

**Answer:** A) True

This fundamental principle of stratigraphy allows geologists to determine relative age based on the vertical position of rock strata.

**3. The process where organic cell walls are replaced with silica or calcium carbonate, turning wood into 'stone' is called \_\_\_\_\_.**

**Answer:** B) Permineralization

Permineralization occurs when mineral-rich groundwater deposits minerals into the internal structures of an organism.

**4. Which isotope is most appropriate for a researcher attempting to date a hominid fossil found in volcanic ash that is approximately 2 million years old?**

**Answer:** B) Potassium-40

Potassium-Argon dating (Potassium-40) is ideal for dating volcanic materials older than 100,000 years, whereas Carbon-14 is only effective up to 50,000 years.

**5. Ichnofossils, such as burrows or footprints, represent the actual skeletal remains of an organism.**

**Answer:** B) False

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

Ichnofossils are also known as 'trace fossils'; they record biological activity or behavior rather than body parts.

**6. The extinction event that marks the boundary between the Paleozoic and Mesozoic Eras is colloquially known as the \_\_\_\_\_.**

**Answer:** C) Great Dying

The Permian-Triassic extinction, or 'The Great Dying,' was the most severe extinction in Earth's history, eliminating over 90% of marine species.

**7. In a geologic cross-section, a fault that cuts through three layers of sedimentary rock is considered \_\_\_\_\_ the rocks it cuts.**

**Answer:** B) Younger than

According to the Principle of Cross-Cutting Relationships, any feature (like a fault or intrusion) that cuts through another must be the younger of the two.

**8. The Proterozoic Eon is characterized by the dominance of complex, multicellular terrestrial life.**

**Answer:** B) False

The Proterozoic saw the rise of eukaryotes and simple multicellularity in oceans, but the land was largely barren until the Phanerozoic Eon.

**9. Which specific geological environment is most conducive to the preservation of soft-bodied organisms, as seen in the Burgess Shale?**

**Answer:** B) Rapid burial in anaerobic mud

Lagerstätten, or exceptional fossil sites, often require rapid burial in low-oxygen (anaerobic) conditions to prevent decay and scavenging.

**10. Geologists use an 'unconformity' in a rock sequence to identify a period of \_\_\_\_\_ in the geologic record.**

**Answer:** C) Missing time

An unconformity represents a gap in the geologic record where rock layers have been eroded or where no deposition occurred for a significant duration.