

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

## Shatter the Fossil Record: A 7th Grade Deep Time Challenge

Students synthesize paleoclimatic data and apply the Law of Faunal Succession to reconstruct fragmented geological histories.

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**1. An outcrop reveals a layer of shale containing fossils of the Glossopteris fern in both Antarctica and India. What synthesis can be made regarding the Paleozoic environment of these now-distant continents?**

- A. They were once part of a contiguous landmass with a similar temperate climate.
- B. Ocean currents carried the heavy seeds across thousands of miles of saltwater.
- C. Convergent evolution caused identical plant species to develop independently.
- D. Antarctica was always located at the South Pole but was much hotter.

**2. In a sequence of undisturbed sedimentary rock, a geologist finds a layer of volcanic ash. This ash serves as a(n) \_\_\_\_\_, allowing scientists to assign an absolute age to the fossil layers above and below it.**

- A. Index fossil
- B. Key bed
- C. Intrusion
- D. Unconformity

**3. True or False: The principle of faunal succession implies that fossil organisms succeed one another in a definite and determinable order, regardless of where they are found globally.**

- A. True
- B. False

**4. Which scenario would most likely lead to the creation of a carbon film fossil of a Ginkgo leaf?**

- A. Rapid burial in a high-energy river timeline with high oxygen.
- B. Immediate consumption by decomposers in a tropical forest.
- C. Compression in fine-grained sediment where liquids and gases are squeezed out.
- D. Slow desiccation in an arid desert environment.

**5. While searching a limestone quarry, you find a 'molded' cavity of a brachiopod shell, but the original shell material is gone. If minerals later fill this cavity and harden, the resulting fossil is called a \_\_\_\_\_.**

- A. Coprolite
- B. Petrification
- C. Cast
- D. Gastrolith

**6. True or False: An unconformity in the rock record represents a continuous, uninterrupted 'tape recording' of Earth's biological history without any gaps in time.**

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- A. True
- B. False

**7. Using the concept of 'half-life,' if a sample of basalt contains only 25% of its original Potassium-40 (and 75% Argon-40), how many half-lives have passed since the rock cooled?**

- A. One half-life
- B. Two half-lives
- C. Three half-lives
- D. Four half-lives

**8. A researcher discovers fossils of benthic (bottom-dwelling) foraminifera in a mountain range. This discovery prompts the conclusion that the region underwent \_\_\_\_\_ uplift over millions of years.**

- A. Volcanic
- B. Tectonic
- C. Glacial
- D. Atmospheric

**9. Why are organisms with hard parts, like the calcified shells of ammonites, significantly more common in the fossil record than soft-bodied organisms like jellyfish?**

- A. Soft-bodied organisms did not exist until the Cenozoic Era.
- B. Hard parts are more resistant to decay and mechanical weathering.
- C. Hard parts contain radioactive isotopes that trigger fossilization.
- D. Ammonites lived in the deep ocean where no oxygen exists.

**10. True or False: If a specific fossil species is found to have lived for only a very short, well-defined period of geological time, it is considered a poor candidate for an index fossil.**

- A. True
- B. False