How Do We Date Fossils and Use Them as Evidence?

Worksheet

Fossils are dated using two main methods: relative dating (comparing rock layer position) and absolute dating (using radioactive decay, especially carbon-14). Together they build Earth's timeline and confirm evolution through the fossil record.

Questions

1. Which dating method compares the position of rock layers?

A) Absolute dating
B) Carbon-14 dating
C) Relative dating
D) Radiometric dating

2. A sample has of its original uranium-235. Half-life is 700 million years. Age?

A) 700 million years
B) 350 million years
C) 1.4 billion years
D) 1 million years

3. Radiometric dating works best on

A) bones and soft tissue
B) rocks and minerals containing radioactive isotopes
C) wood and peat
D) sedimentary layers

4. Why is the fossil record considered evidence for evolution?

A) It shows all species alive today lived in the past
B) It shows gradual change and species transitions over time
C) It proves organisms cannot adapt
D) It shows species remain unchanged

5. A fossil is found in a rock layer. The layer below it is dated at 150 million years, the layer above at 100 million years. What is the fossil's age?

6. A bone sample has of its original C-14. Carbon-14 has a half-life of 5,730 years. How old is the bone?

7. Trilobite fossils are found in rocks in New York and Morocco. How can we tell if they lived at the same time?

8. Define: What is a fossil?

9. Define: What is relative dating?

10. Define: What is absolute dating?

Answer Key

1. C) Relative dating - Relative dating uses layer position. Older fossils are deeper; younger are higher (law of superposition).

2. A) 700 million years - One half-life has passed: remains, so age = 700 million years.

3. B) rocks and minerals containing radioactive isotopes - Igneous rocks contain radioactive elements; potassium-40 and uranium isotopes decay at known rates.

4. B) It shows gradual change and species transitions over time - Fossils show ancient species different from modern ones, with transitional forms linking major groups.

5. Using relative dating: fossil is between 100 and 150 million years old. More precise dating requires testing the rock or fossil for radioactive isotopes (C-14 for <50k years, uranium/potassium for older fossils).

6. After 1 half-life: remains (5,730 years) After 2 half-lives: remains (11,460 years) Age = 11,460 years

7. Compare rock layer ages using radiometric dating. If both fossils are in rocks dated ~300 million years ago, they lived in the same time period. This shows trilobites were geographically widespread (biostratigraphy).

8. Preserved remains or traces of ancient organisms - bones, shells, imprints, footprints or petrified wood.

9. Determining a fossil's age by comparing the rock layers it is found in (oldest at bottom, youngest at top).

10. Determining a fossil's actual age in years using radioactive decay (radiometric dating), such as carbon-14 or potassium-40.