

## CHAPTER 21: The History of Life on Earth

1. How are fossils significant to our study of biology?

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2. Review these key points in the study of fossils:

a. Sedimentary rocks are the richest source of fossils.

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b. Paleontologists use a variety of methods to date fossils.

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c. Continental drift.

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d. The history of life is punctuated by mass extinctions show how...

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3. What are some examples of fossils?

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4. What marks the separation between the major eras/periods in the geologic time scale?

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5. What are a few ways how earth's environment has changed?

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6. Start with the origin of the earth and identify the **time frame, conditions, and evidence** for each of the following steps to current life forms on earth.

a. Origin of the earth –

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b. Prokaryotic life –

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c. Oxygen in the atmosphere –

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d. Eukaryotic life –

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e. Multicellular life –

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7. What was significant about the discovery of the iridium bands in some sedimentary layers?

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8. What was special about the Cambrian Explosion?

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9. Describe a few adaptations that were essential for the invasion of plants onto land.

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10. Describe the hypothesized conditions on earth when life arose.

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11. What did Oparin, Haldane, Miller, and Urey accomplish?

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12. Why is RNA now thought to be the first genetic code?

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13. What was Lynn Margulis' contribution to the evolution of life on earth?

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14. What are two problems with the five kingdom system of classification?

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

Note Set 33

15. How has the Domain System altered our view of taxonomy?

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16. Which type of prokaryote is closer to the eukaryotes? List **several** reasons for your answer.

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17. Place the following metabolic processes in an order that fits this hypothesis for the origin of life: Photosynthesis, Aerobic Respiration, Fermentation, Nucleic Acid Replication (RNA or DNA), Membrane Transport.

**END OF CHAPTER 21 MULTIPLE CHOICE**

1. The number of species of fossil organisms that have been described is about
  - A) 50,000.
  - B) 100,000.
  - C) 200,000.
  - D) 300,000.
  - E) 500,000.
  
2. In undisturbed strata of sedimentary rock,
  - A) the oldest rocks lie at the top.
  - B) the oldest rocks lie at the bottom.
  - C) the oldest rocks are in the middle.
  - D) the oldest rocks are distributed among the strata of younger rocks.
  - E) None of the above
  
3. Carbon-14 can be used to determine the ages of fossil organisms because
  - A) all organisms contain many carbon compounds.
  - B) carbon-14 has a regular rate of decay to carbon-12.
  - C) the ratio of  $^{14}\text{C}$  to  $^{12}\text{C}$  in living organisms is always the same as that in the atmosphere.
  - D) the production of new  $^{14}\text{C}$  in the atmosphere just balances the natural radioactive decay of  $^{14}\text{C}$ .
  - E) All of the above
  
4. An important, generally unidirectional change in Earth during its history is a
  - A) steady increase in volcanic activity.
  - B) gradual coming together of the continents.
  - C) steady increase in the oxygen content of the atmosphere.
  - D) gradual warming of the climate.
  - E) steady increase in Earth's precipitation.
  
5. The total of all species of organisms in a given region is known as the region's
  - A) biota.
  - B) flora.
  - C) fauna.
  - D) flora and fauna.
  - E) diversity.

6. The coal beds we now mine for energy are the remains of
  - A) trees that grew in swamps during the Carboniferous period.
  - B) trees that grew in swamps during the Devonian period.
  - C) trees that grew in swamps during the Permian period.
  - D) small plants that grew in swamps during the Carboniferous period.
  - E) None of the above
  
7. The cause of the mass extinction at the end of the Ordovician period was probably
  - A) the collision of Earth with a large meteorite.
  - B) massive volcanic eruptions.
  - C) massive glaciation in Gondwana.
  - D) the uniting of all continents to form Pangaea.
  - E) changes in Earth's orbit.
  
8. The cause of the mass extinction at the end of the Mesozoic era probably was
  - A) continental drift.
  - B) the collision of Earth with a large meteorite.
  - C) changes in Earth's orbit.
  - D) massive glaciation.
  - E) changes in the salt concentration of the oceans.
  
9. The times during the history of life when many new evolutionary lineages appeared were the
  - A) Precambrian, Cambrian, and Triassic.
  - B) Precambrian, Cambrian, and Tertiary.
  - C) Cambrian, Paleozoic, and Triassic.
  - D) Cambrian, Triassic, and Devonian.
  - E) Paleozoic, Triassic, and Tertiary.
  
10. At which of the following times was there no mass extinction?
  - A) The end of the Cretaceous period
  - B) The end of the Devonian period
  - C) The end of the Permian period
  - D) The end of the Triassic period
  - E) The end of the Silurian period