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Section 17–2 Earth's Early History (pages 423–428)

This section explains how Earth formed. It also outlines hypotheses that have been proposed for how life first arose on Earth and describes some of the main steps in the early evolution of life.

Formation of Earth (pages 423–424)

1. List six components of Earth's early atmosphere.

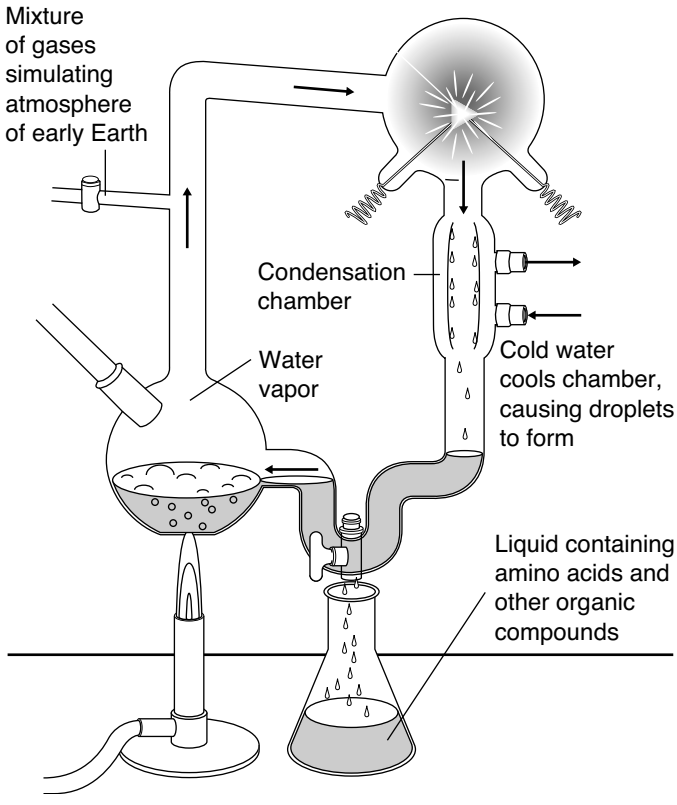
a. _____ **c.** _____ **e.** _____

b. _____ **d.** _____ **f.** _____

2. Is the following sentence true or false? Liquid water first occurred on Earth more than 4 billion years ago. _____

The First Organic Molecules (page 424)

3. Label the diagram to show which part of Miller and Urey's apparatus simulated lightning storms on early Earth.



4. Circle the letter of each sentence that is true about Miller and Urey's experiments.

a. Their purpose was to determine how the first organic molecules evolved.

b. They led to the formation of several amino acids.

c. They accurately simulated conditions in Earth's early atmosphere.

d. The results were never duplicated in experiments by other scientists.

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How Did Life Begin? (page 425)

5. What are proteinoid microspheres? _____

6. Is the following sentence true or false? Scientists know how DNA and RNA evolved. _____

7. Why do scientists think that RNA may have evolved before DNA? _____

8. Once DNA evolved, why would it have become the primary means of transmitting genetic information? _____

Free Oxygen (page 426)

9. Microscopic fossils are called _____.

10. Circle the letter of each sentence that is true about the earliest life forms on Earth.
    - **a.** They resembled modern bacteria.
    - **b.** They were eukaryotes.
    - **c.** They relied on oxygen.
    - **d.** They were not preserved as fossils.

11. How did early photosynthetic bacteria change Earth? _____

12. Is the following sentence true or false? The rise of oxygen in the atmosphere drove some life forms to extinction. _____

Origin of Eukaryotic Cells (pages 427–428)

13. Is the following sentence true or false? The ancestor of all eukaryotic cells evolved about 2 billion years ago. _____

14. What was the first step in the evolution of eukaryotic cells? _____

15. What does the endosymbiotic theory propose? _____

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16. Circle the letter of each choice that provides support for the endosymbiotic theory.

a. The membranes of mitochondria and chloroplasts resemble the plasma membranes of free-living prokaryotes.

b. Mitochondria and chloroplasts do not have DNA.

c. Mitochondria and chloroplasts have ribosomes that are similar in size and structure to those of bacteria.

d. Mitochondria and chloroplasts reproduce by binary fission as bacteria do.

Sexual Reproduction and Multicellularity (page 428)

17. How did sexual reproduction speed up the evolutionary process? _____

_____

_____

_____

18. Is the following sentence true or false? Sexual reproduction evolved after the first multicellular organisms appeared. _____

Reading Skill Practice

When you read a section that contains new or difficult material, identifying the sentence that best expresses the main topic under each heading can help you focus on the most important points. For each heading in Section 17–2, identify and copy the sentence that best expresses the main topic under that heading. Do your work on a separate sheet of paper.