

01.03 Biology Notebook: Earth's Early Atmosphere

Page 1: Origin of Life on Earth

What makes Earth an ideal home for its diverse inhabitants?

Key Terms: Jot down terms and definitions that are new to you. You will see them used in the lesson.

Page 2: The Early Earth

What was Earth's early atmosphere made of?

Compare and contrast early Earth and modern Earth.

What are organic molecules?

Why are scientists interested in the origin of organic molecules?

What are two examples of organic molecules that scientists think first formed?

Why are the reactions that occurred in early earth different from modern Earth?

Page 3: Chemical Experiments

What hypothesis did Miller and Urey want to test?

What did their experiment produce?

What did they add to make it like Earth's early atmosphere?

Where did they think that the energy came from to cause this process to occur?

What was formed based on the results of the experiment?

Page 4: Chemical Evolution

What is another way that organic molecules might have arrived on Earth?

How did large organic molecules form without the presence of enzymes?

What do all living organisms contain?

Explain the RNA world hypothesis. (Be sure to explain the significance of both DNA and RNA)

Define catalyst.

Explain what helps RNA catalyze.

Page 5: Early Cells

Describe the earliest cells.

Did the first prokaryotic cells need oxygen?

How did the first prokaryotic cells obtain energy?

Define heterotroph.

What did the early cells have as a food source?

List the four types of cells found today that scientists believe are similar to the early cells on Earth and one interesting fact about each.

- 1.
- 2.
- 3.

4.

What does fossil evidence show us about the earliest and most abundant autotrophic cells?

What are cyanobacteria and why are they important?

As cyanobacteria and other autotrophs increased, how did the atmosphere change?

What became the dominant life forms on the planet as the oxygen became more abundant?

Page 6: Formation of Microspheres

What is a microsphere?

Microspheres are not cells, but they do have similar characteristics. Identify the characteristics of microspheres.

How do microspheres grow and what happens when it reaches an unstable size?

How does the hypothesis of microspheres build on the RNA world hypothesis?

Practice question:

If there was not an increase in cyanobacteria in early Earth, what would have happened to Earth's early atmosphere?

- A. The amount of oxygen would have increased, causing an increase in aerobic autotrophs and heterotrophs
- B. The amount of oxygen would have increased, causing a decrease in aerobic autotrophs and heterotrophs.
- C. The amount of oxygen would have decreased, causing an increase in aerobic autotrophs and heterotrophs.
- D. The amount of oxygen would have decreased, causing a decrease in aerobic autotrophs and heterotrophs.

Which best describes the atmosphere of the early Earth?

- A. Little or no oxygen, mostly carbon dioxide, water vapor, and nitrogen
- B. Little or no carbon dioxide, mostly oxygen, water vapor, and nitrogen
- C. Little or no water vapor, mostly oxygen and carbon dioxide, with some nitrogen
- D. Large amounts of hydrogen cyanide with low amounts of carbon dioxide and oxygen