Name _____ Class _____ Date _____

SECTION 14-3 REVIEW

THE FIRST LIFE-FORMS

VOCABULARY REVIEW Define the following terms.

1. ribozyme _____
2. chemosynthesis _____
3. cyanobacteria _____
4. endosymbiosis _____

MULTIPLE CHOICE Write the correct letter in the blank.

_____ **1.** The idea that life may have started with self-replicating molecules of RNA is based on the observation that RNA can

a. take on a great variety of shapes and act as an enzyme.
b. link nucleotides together to form proteins.
c. create proteins that have the ability to replicate themselves.
d. produce ribozymes that have the ability to produce other ribozymes.

_____ **2.** The first organisms on Earth were probably

a. autotrophic, aerobic eukaryotes.
b. heterotrophic, aerobic eukaryotes.
c. autotrophic, aerobic prokaryotes.
d. heterotrophic, anaerobic prokaryotes.

_____ **3.** The main difference between chemosynthetic autotrophs and photosynthetic autotrophs is that only

a. photosynthetic autotrophs use CO_2 as a carbon source.
b. chemosynthetic autotrophs use CO_2 as a carbon source.
c. chemosynthetic autotrophs obtain energy from inorganic molecules.
d. photosynthetic autotrophs synthesize organic compounds.

_____ **4.** An early function of aerobic respiration may have been to

a. increase the amount of oxygen in the upper atmosphere.
b. prevent the destruction of essential organic compounds by oxygen.
c. provide more oxygen for photosynthesis.
d. enable land animals to breathe.

_____ **5.** The eukaryotic organelle that is thought to have evolved from aerobic prokaryotes is the

a. chloroplast. **b.** nucleus. **c.** ribosome. **d.** mitochondrion.

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SHORT ANSWER Answer the questions in the space provided.

1. Explain how early RNA molecules might have been able to respond to natural selection. _____

2. What role did the appearance of the ozone layer play in the evolution of early life on Earth?

3. Name three characteristics of mitochondria and chloroplasts that support the endosymbiotic hypothesis of eukaryotic evolution. _____

4. **Critical Thinking** How would endosymbiosis have been mutually beneficial for pre-eukaryotic cells and for the small prokaryotes that invaded them? _____

STRUCTURES AND FUNCTIONS Arrange the organisms listed below in the order in which they are thought to have originated on Earth by writing their names in the spaces provided in the figure.

photosynthetic prokaryotes
photosynthetic eukaryotes
chemosynthetic prokaryotes
aerobic eukaryotes
heterotrophic prokaryotes