Name _____ Class _____ Date _____

Reviewing Key Concepts

Short Answer *On the lines provided, answer the following questions.*

1. What are three ways in which archaebacteria differ from eubacteria?

_____

_____

2. Describe four factors that are used to identify prokaryotes.

_____

_____

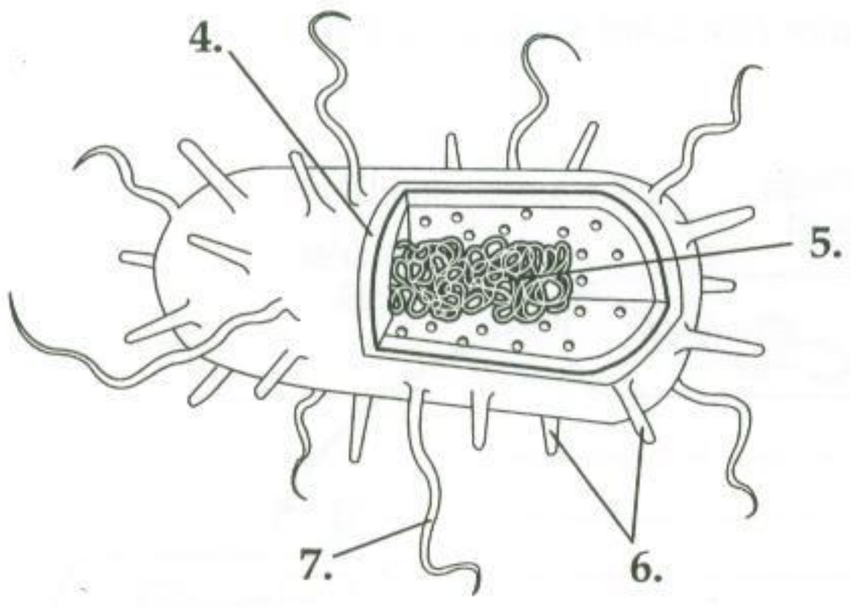
3. What are three ways in which bacteria are vital to the living world?

_____

_____

Reviewing Key Skills

Interpreting Graphics *On the lines provided, label the diagram using the following terms:* cell wall, pili, flagellum, DNA. *Then, use the diagram to answer questions 8 and 9.*



4. _____
5. _____
6. _____
7. _____

8. **Classifying** Is the bacterium in the diagram a bacillus, coccus, or spirillum? Explain your answer.

_____

9. **Predicting** How would you expect this bacterium to move?

_____

10. **Comparing and Contrasting** In prokaryotes, how are binary fission and conjugation different?

_____

_____

_____

Name _____ Class _____ Date _____

Reviewing Key Concepts

Multiple Choice *On the lines provided, write the letter of the answer that best completes each sentence.*

_____ **1.** A typical virus has a core composed of
a. capsid proteins. c. membrane envelopes.
b. surface proteins. d. DNA or RNA.

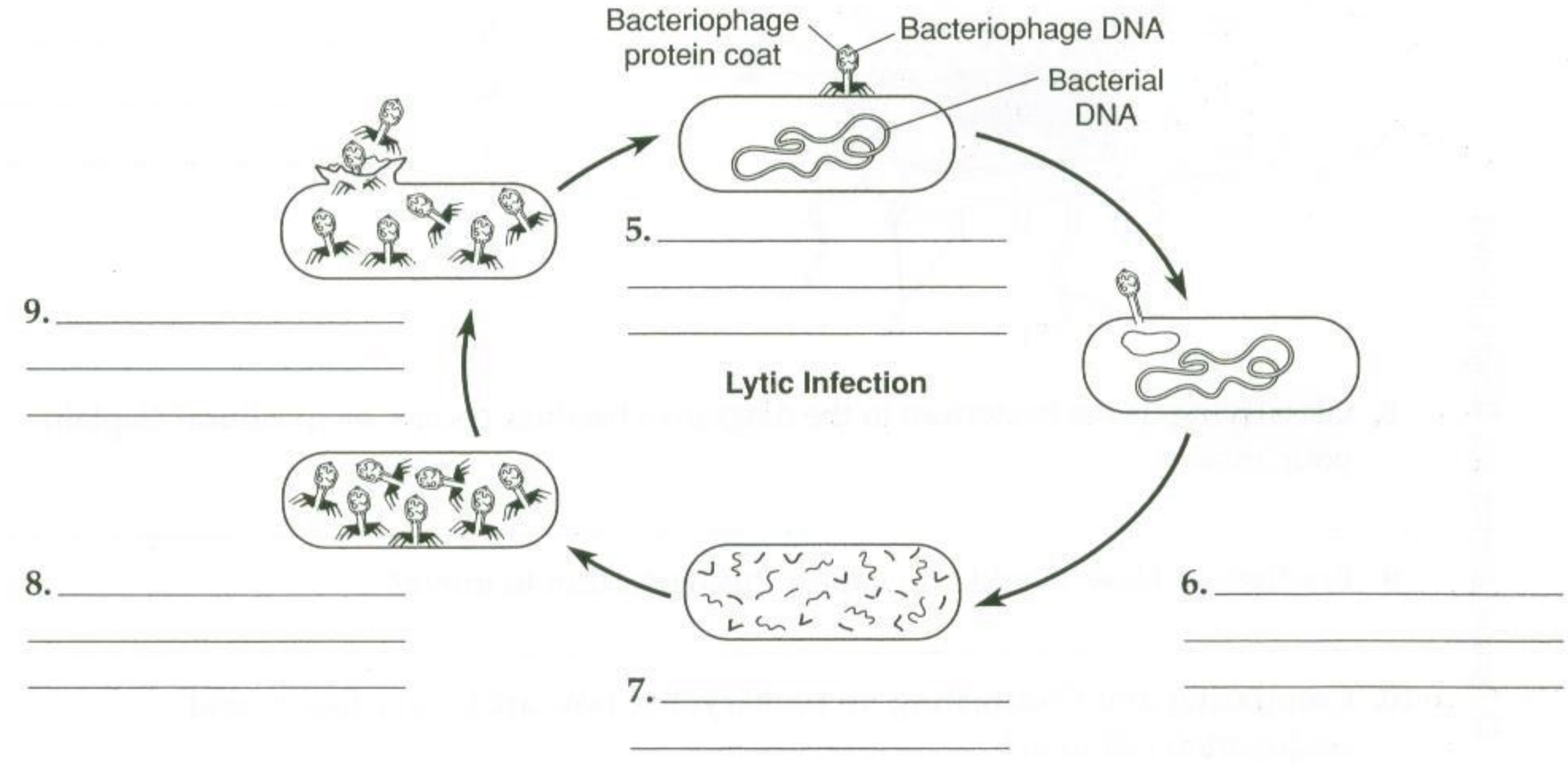
_____ **2.** The outer layer of a virus is composed of
a. RNA. c. DNA.
b. viral genes. d. proteins.

_____ **3.** An infection in which a virus makes copies of itself and causes the host cell to burst is called
a. lysogenic. c. lytic.
b. oncogenic. d. capsid.

_____ **4.** An infection in which DNA of a virus is embedded into a host cell and replicates with host DNA is called
a. lysogenic. c. lytic.
b. oncogenic. d. capsid.

Reviewing Key Skills

Interpreting Graphics *On the lines provided, describe what is occurring in each stage of the lytic cycle.*



10. Applying Concepts Why are viruses not considered to be living things?

_____

_____

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Reviewing Key Concepts

Completion *On the lines provided, complete the following sentences.*

1. One way that bacteria can cause disease is by breaking down and damaging _____ of the infected organism.
2. Bacteria can also cause disease by releasing _____ that harm the body.
3. A(an) _____ is a disease-causing agent.
4. One way to control bacterial growth is by subjecting them to great heat, a process called _____.
5. A(an) _____ is a preparation of weakened or killed pathogens that can prompt the body to produce immunity to a disease.

Reviewing Key Skills

6. **Comparing and Contrasting** How are the causes of tuberculosis and strep throat similar? How are they different?

7. **Inferring** Why can't viruses be treated with antibiotics?

8. **Comparing and Contrasting** Describe the similarities and differences of antibiotics and disinfectants.

9. **Inferring** Why should meats be cooked until they are well done?

10. **Comparing and Contrasting** What are the similarities and differences of viroids and prions?

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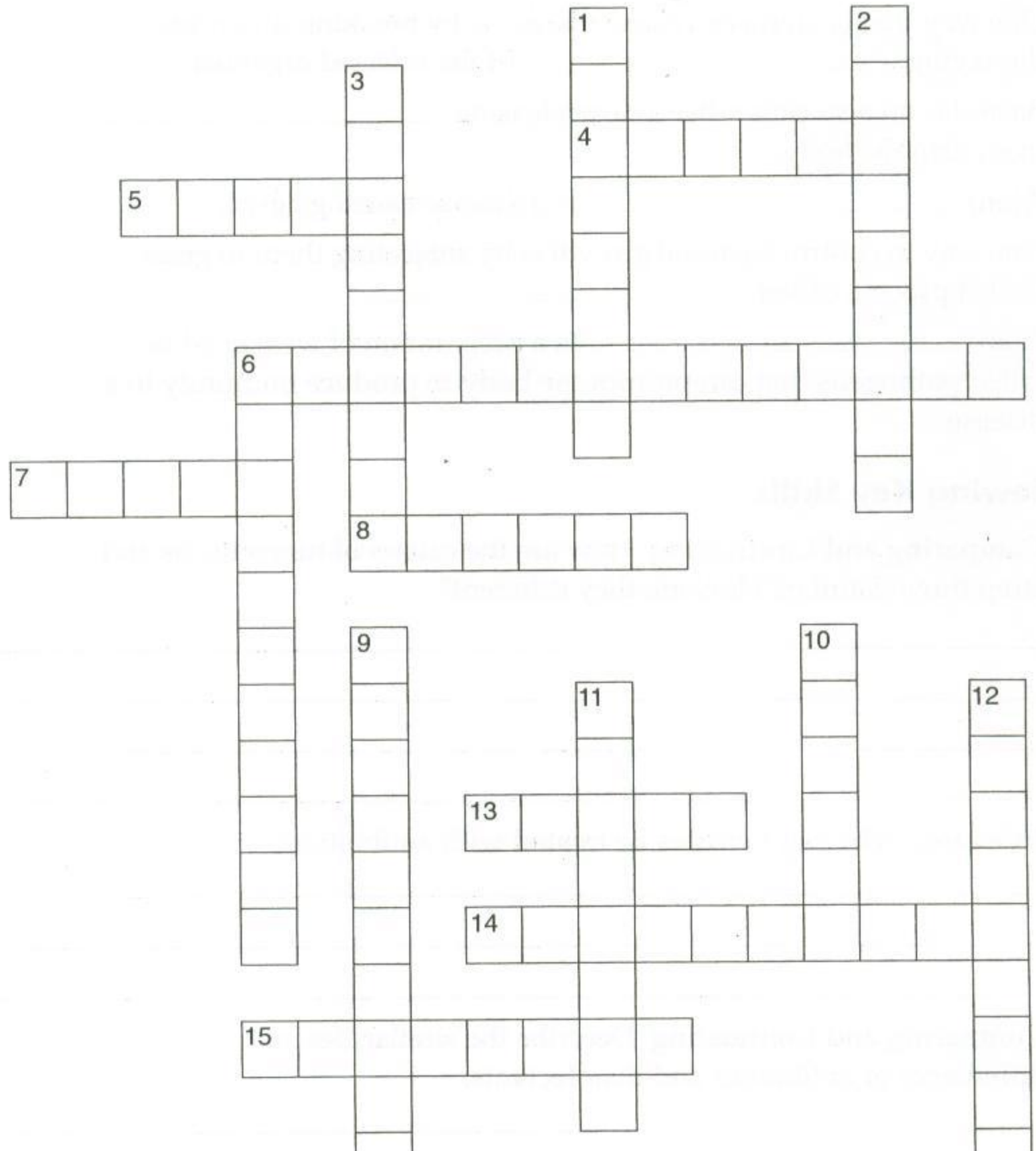
Crossword Puzzle *Use the clues below and on the following page to complete the puzzle.*



Across

4. the outer protein coat of a virus
5. particle of nucleic acid and protein that can reproduce only by infecting living cells
6. organism that obtains energy directly from inorganic molecules
7. an infectious particle made of protein rather than DNA or RNA
8. sphere-shaped bacterium
13. type of infection in which the host cell bursts and is destroyed
14. single-celled microorganism that lacks a nucleus
15. disease-causing agent

Down

1. rod-shaped bacterium
2. type of spore that can remain dormant until favorable conditions for growth arise
3. type of infection in which a host cell makes copies of the virus indefinitely
6. how bacteria exchange genetic material
9. compound that blocks the growth and reproduction of bacteria
10. Bacteria may reproduce by _____ fission.
11. The process of converting nitrogen into a form that plants can use is _____ fixation.
12. a structure prokaryotes use to propel themselves

Completion *On the lines provided, complete the following sentences.*

16. The larger of the two kingdoms of prokaryotes is the _____.
17. The _____ may be the ancestors of eukaryotes.
18. A corkscrew-shaped bacterium is called a(an) _____.
19. A whiplike structure used for movement is a(an) _____.
20. A prokaryote that carries out photosynthesis is called a(an) _____.
21. A(An) _____ is photosynthetic, but also requires organic compounds for nutrition.
22. Organisms that require a constant supply of oxygen in order to live are called obligate _____.
23. Bacteria that are killed by oxygen are called obligate _____.
24. Bacteria that can survive with or without oxygen are known as _____ anaerobes.
25. Bacteria that attack and digest dead tissue are called _____.
26. A typical _____ is composed of a core of DNA or RNA surrounded by a protein coat.
27. A virus that infects bacteria is called a(an) _____.
28. A virus that stores its genetic information as RNA is called a(an) _____.
29. A(An) _____ can be used to cure many bacterial diseases.
30. Techniques of _____ rely on extreme temperatures or chemical action to destroy bacteria.

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Acid-Fast Bacteria

Almost all bacteria can be classified as Gram-positive or Gram-negative by a process called Gram staining. Very few bacteria are Gram-positive. Most bacteria, yeasts, and fungi are Gram-negative. How bacteria respond to the Gram-staining procedure can provide information about the nutritive requirements, cell wall composition, and other traits of the bacteria. When treated with special dyes, Gram-positive bacteria appear deep violet in color. Gram-negative bacteria appear pink. The Gram-staining technique can help doctors identify bacteria and choose the correct antibiotics to treat bacterial infections.

Some bacteria, however, are resistant to Gram staining. These bacteria are known as acid-fast bacteria, and are identified by using the acid-fast stain. In this procedure, a sample of unknown bacteria is dyed and then washed with acidified alcohol. This will remove most of the dye. Those bacteria that "hold fast" to the dye will be strongly stained and readily identifiable as acid-fast bacteria.

Because acid-fast bacteria are a major cause of disease, it is particularly important to be able to identify them. The acid-fast bacteria form a homogeneous group composed of the genera *Mycobacterium* and *Nocardia.* Mycobacteria are usually rod shaped, and are found in soil, water, and animals. Many species are saprophytic (feed on dead organic matter); others cause diseases such as diphtheria, tuberculosis, and leprosy.

Acid-fast bacteria are characterized by their high lipid content. Lipids and waxes make up as much as 40 percent of the dry weight of acid-fast bacteria. These lipids and waxes are the key to testing for acid-fast bacteria. The lipids and waxes absorb dye so it can't be removed with acidified alcohol. This is how acid-fast bacteria "hold fast" to dye and remain stained while bacteria are washed clean.

Evaluation *On the lines provided, answer the following questions.*

1. How are acid-fast bacteria different from other bacteria?

_____

_____

_____

_____

_____

2. Why is it important to wash the bacteria sample after it has been dyed?

_____

_____

_____

_____

_____

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Concept Map

Using information from the chapter, complete the concept map below. If there is not enough room in the concept map to write your answers, write them on a separate sheet of paper.