Section 19–1 Bacteria (pages 471–477)

Key Concepts
- How do the two groups of prokaryotes differ?
- What factors are used to identify prokaryotes?
- What is the importance of bacteria?

Introduction (page 471)
1. What are prokaryotes? ____________________________

2. Is the following sentence true or false? Prokaryotes are much smaller than most eukaryotic cells. ________________

Classifying Prokaryotes (pages 471–472)
3. What are the two different groups of prokaryotes?
   a. ________________________  b. ________________________

4. Which is the larger of the two kingdoms of prokaryotes? ________________________

5. Where do eubacteria live? ________________________

6. What protects a prokaryotic cell from injury? ________________________

7. Circle the letter of what is within the cell wall of a prokaryote.
   a. another cell wall  c. archaeabacteria
   b. cell membrane  d. pili

8. What is peptidoglycan? ________________________

9. Some eubacteria have a second ________________ outside the cell membrane.

10. Circle the letter of each sentence that is true about archaeabacteria.
    a. Their membrane lipids are different from those of eubacteria.
    b. They lack a cell wall.
    c. They lack peptidoglycan.
    d. They look very similar to eubacteria.

11. What is significant about the DNA sequences of key archaebacterial genes?
    ________________________

12. How are archaebacteria related to eukaryotes?
    ________________________
13. What are methanogens, and where do they live?

14. Use the following labels to complete the illustration of a typical prokaryote: cell membrane, cell wall, DNA, flagellum.

Identifying Prokaryotes (page 473)

15. What are four characteristics used to identify prokaryotes?
   a. ______________________________
   b. ______________________________
   c. ______________________________
   d. ______________________________

16. What are each of the differently shaped prokaryotes called?
   a. The rod-shaped are called ______________.
   b. The spherical-shaped are called ______________.
   c. The corkscrew-shaped are called ______________.

17. A method of telling two different types of eubacteria apart by using dyes is called ____________________.

18. What colors are Gram-positive and Gram-negative bacteria under the microscope when treated with Gram stain?

19. What are flagella? ______________________________
Metabolic Diversity (pages 473–474)

21. Complete the table about prokaryotes classified by the way they obtain energy.

<table>
<thead>
<tr>
<th>GROUPS OF PROKARYOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Chemoautotroph</td>
</tr>
<tr>
<td>Photoheterotroph</td>
</tr>
</tbody>
</table>

22. Members of which group of photoautotrophs contain a bluish pigment and chlorophyll a? ____________________________

23. How do the chemoautotrophs that live near hydrothermal vents on the ocean floor obtain energy? _____________________________________________

24. Complete the table about prokaryotes classified by the way they release energy.

<table>
<thead>
<tr>
<th>GROUPS OF PROKARYOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Obligate anaerobes</td>
</tr>
<tr>
<td>Facultative anaerobes</td>
</tr>
</tbody>
</table>

25. Facultative anaerobes can switch between cellular respiration and ________________.

Growth and Reproduction (page 475)

26. What occurs in the process of binary fission? _____________________________________________

27. What occurs during conjugation? _____________________________________________

28. Is the following sentence true or false? Most prokaryotes reproduce by conjugation. ________________
29. What is an endospore?

30. How do decomposers help the ecosystem recycle nutrients when a tree dies?

31. What would happen to plants and animals if decomposers did not recycle nutrients?

32. Why do plants and animals need nitrogen?

33. How does nitrogen fixation help plants?

34. What kind of relationship do many plants have with nitrogen-fixing bacteria?

35. How can bacteria be used to clean up an oil spill?

36. What have biotechnology companies begun to realize about bacteria adapted to extreme environments?

Reading Skill Practice

Writing a summary can help you remember the information you have read. When you write a summary, write only the most important points. Write a summary of the information under the green heading Decomposers. Your summary should be shorter than the text on which it is based. Do your work on a separate sheet of paper.