Section 7–2 Eukaryotic Cell Structure (pages 174–181)

This section describes the functions of the major cell structures.

Comparing a Cell to a Factory (page 174)

1. What is an organelle? __________________________________________________________________________

2. Label the structures on the illustration of the plant cell.

3. Circle the letter of each structure that animal cells contain.
   a. chloroplasts  b. lysosomes  c. mitochondria  d. ER

4. Circle the letter of each structure that plant cells contain.
   a. cell wall  b. ER  c. lysosomes  d. chloroplast

Nucleus (page 176)

5. What is the function of the nucleus? __________________________________________________________________________

6. What important molecules does the nucleus contain? __________________________________________________________________________

7. The granular material visible within the nucleus is called _________________.
8. What does chromatin consist of? 
   It consists of DNA bound to protein.

9. What are chromosomes? 
   They are distinct, threadlike structures formed of condensed chromatin that contain genetic information that is passed from one generation of cells to the next.

10. Most nuclei contain a small, dense region known as the ________________.

11. What occurs in the nucleolus? 
   This is where the assembly of ribosomes begins.

12. What is the nuclear envelope? 
   It is a double-membrane layer that surrounds the nucleus.

Ribosomes (page 177)

13. What are ribosomes? 
   Ribosomes are small particles of RNA and protein found throughout the cytoplasm that are involved in protein synthesis.

Endoplasmic Reticulum (pages 177–178)

14. What is the difference between rough ER and smooth ER? 
   Ribosomes are found on the surface of rough ER. There are no ribosomes on smooth ER.

Golgi Apparatus (page 178)

15. Using the cell as a factory analogy, describe the role of the Golgi apparatus in the cell.
   The Golgi apparatus is like a customization shop, where the finishing touches are put on proteins before they are ready to leave the cell “factory.”

Lysosomes (page 179)

16. Circle the letter of each sentence that is true about lysosomes.
   a. They contain enzymes that help synthesize lipids.
   b. They break down organelles that have outlived their usefulness.
   c. They produce proteins that are modified by the ER.
   d. They contain enzymes that break down lipids, carbohydrates, and proteins.
Vacuoles (page 179)
17. What are vacuoles? Vacuoles are saclike structures that store materials such as water, salts, proteins, and carbohydrates.

18. What is the role of the central vacuole in plants? When the central vacuole is filled with liquid, the pressure within the vacuole supports the heavy structures of the plant, such as leaves and flowers.

19. How does the contractile vacuole in a paramecium help maintain homeostasis? By contracting rhythmically, the contractile vacuole pumps excess water out of the cell.

Mitochondria and Chloroplasts (pages 179–180)
20. Is the following sentence true or false? Both chloroplasts and mitochondria are enclosed by two membranes. _____________

21. Chloroplasts and mitochondria contain their own genetic information in the form of ____________________.

22. Biologist Lynn Margulis has suggested that mitochondria and chloroplasts are descendants of what kind of organisms? ____________________

Cytoskeleton (page 181)
23. What is the cytoskeleton? It is a network of protein filaments that helps the cell to maintain its shape.
Name______________________________ Class __________________ Date ______________

24. Complete the table about structures that make up the cytoskeleton.

**STRUCTURES OF THE CYTOSKELETON**

<table>
<thead>
<tr>
<th>Structure</th>
<th>Description</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Maintain cell shape, help build cilia and flagella, form centrioles in cell division</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support the cell, help cells move</td>
</tr>
</tbody>
</table>

**Match the organelle with its description.**

**Organelle**

- 25. Ribosome
- 26. Endoplasmic reticulum
- 27. Golgi apparatus
- 28. Lysosome
- 29. Vacuole
- 30. Chloroplast
- 31. Mitochondrion

**Description**

a. Uses energy from sunlight to make energy-rich food
b. Stack of membranes in which enzymes attach carbohydrates and lipids to proteins
c. Uses energy from food to make high-energy compounds
d. An internal membrane system in which components of cell membrane and some proteins are constructed
e. Saclike structure that stores materials
f. Small particle of RNA and protein that produces protein following instructions from nucleus
g. Filled with enzymes used to break down food into particles that can be used

**Reading Skill Practice**

A flowchart can help you remember the order in which events occur. On a separate sheet of paper, create a flowchart that describes the steps by which proteins are made in the cell. You will find that the steps of this process are explained on pages 176–178. For more information about flowcharts, see Organizing Information in Appendix A in your textbook.