

## Unit 1 Review

### Summary

- Scientists made their first discoveries about cells through the use of microscopes. These discoveries led to the formation of the cell theory.
- The cell theory states the following: All living things are made up of cells. The cell is the basic unit of structure and function in all living things. All cells come from other cells.
- Most cells contain a cell membrane, a nucleus, and cytoplasm. Organelles are cell structures with specific jobs. Organelles are located in the cytoplasm of most cells.
- Eukaryotic cells contain a nucleus. Prokaryotic cells lack a nucleus. Plant cells and animal cells are eukaryotic cells. Plant cells contain a cell wall and chloroplasts.
- The cell membrane controls the flow of materials into and out of the cell. Many substances move across a cell by diffusion. Water moves into or out of a cell by osmosis. Since neither process uses energy, diffusion and osmosis are types of passive transport.
- Sometimes energy is needed to move substances across a cell membrane. Such processes are called active transport. Cells get the energy needed for active transport through cellular respiration and fermentation.
- Photosynthesis is the process by which producers change energy from the sun into chemical energy. Photosynthesis occurs in the chloroplasts of plant cells.
- The cell cycle is the continuous process by which cells grow, prepare for division, and divide into new cells. The new cells are called daughter cells.
- Mitosis is the process of distributing chromosomes from a parent cell to each daughter cell during cell division. The four steps of mitosis are prophase, metaphase, anaphase, and telophase.



## For Your Portfolio

1. With a group of classmates, design a skit in which an animal cell and a plant cell meet. Topics the cells might “discuss” include their unique structures and the processes by which they get energy. Perform your skit for the class.
2. Suppose you were asked to explain diffusion to some of your classmates. Design an activity to illustrate the process. For example, you could use an open bottle of perfume to demonstrate the process.
3. Draw a cartoon that shows how a molecule enters a cell through active transport. Include captions to describe what the molecule is “thinking” on its “trip” into the cell.
4. Make a flow chart to illustrate the process of photosynthesis. Do not show it to your classmates. Then draw different parts of your flow chart on separate pieces of paper. Exchange your papers with those of another student. Try to organize the parts of your classmate’s flow chart in the correct order. Your classmate will try to organize yours. Compare your results with the original charts.
5. Use paper plates, small squares of paper, rubber bands, and strips of yarn to show how chromosomes are distributed during mitosis. Tie together two rubber bands. Repeat this three more times. The rubber band pairs represent four pairs of chromosomes. Use single rubber bands to show single chromosomes. The paper plates represent the cell. The squares of paper are the centrioles. The yarn strips are the spindle fibers. Work in groups of four. On a stiff poster board, make four diagrams using the materials described above to show the four stages of mitosis. All members of the group may work together on all the stages or each member can design one stage for the poster.

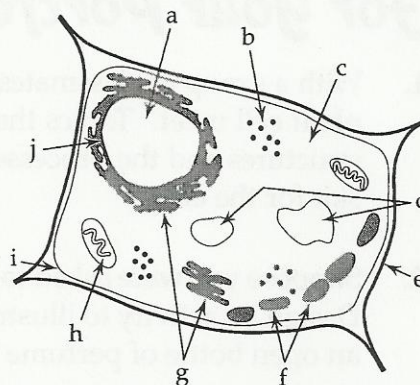


# Unit 1 PRACTICE TEST

Match the correct letter from Fig. PT-1 with each of the following parts of a cell. Write the letter in the space provided.

- |                                |                           |
|--------------------------------|---------------------------|
| _____ 1. cell membrane         | _____ 6. mitochondrion    |
| _____ 2. cell wall             | _____ 7. nuclear membrane |
| _____ 3. chloroplasts          | _____ 8. nucleus          |
| _____ 4. cytoplasm             | _____ 9. ribosomes        |
| _____ 5. endoplasmic reticulum | _____ 10. vacuoles        |

Fig. PT-1



Answer each of the following questions about Fig. PT-1.

11. Is the cell shown in the diagram a plant cell or an animal cell? Explain your answer.

---



---

12. Is the cell shown in the diagram a eukaryotic cell or prokaryotic cell? Explain your answer.

---

13. Explain the process by which the cell shown in the diagram obtains energy.

---



---

14. How could the cell shown in the diagram obtain water without using energy?

---



---

15. How are the chloroplasts of a plant cell similar to the mitochondria of an animal cell?

---



---

Answer one of the following questions.

16. Make a sketch to show why the two daughter cells formed by mitosis are identical to their parent cell. Or, write an essay to explain why this occurs.

17. A certain substance has a higher concentration inside the cell than outside. But the cell needs even more of the substances inside. What kind of transport is needed? Draw a diagram or write an essay to describe the relationship between the concentration of the substance and the type of transport needed.