

7 Assessment

7.1 Life Is Cellular

Understand Key Concepts

1. In many cells, the structure that controls the cell's activities is the
 - a. cell membrane.
 - b. organelle.
 - c. nucleolus.
 - d. nucleus.
2. Despite differences in size and shape, at some point all cells have DNA and a
 - a. cell wall.
 - b. cell membrane.
 - c. mitochondrion.
 - d. nucleus.
3. What distinguishes a eukaryotic cell from a prokaryotic cell is the presence of
 - a. a cell wall.
 - b. a nucleus.
 - c. DNA.
 - d. ribosomes.
4. **© Integration of Knowledge and Ideas** Create a table that summarizes the contributions made to the cell theory by Robert Hooke, Matthias Schleiden, Theodor Schwann, and Rudolf Virchow.

Think Critically

5. **Apply Concepts** If you wanted to observe a living organism—an amoeba, for example—which type of microscope would you use?
6. **© Craft and Structure** How are prokaryotic and eukaryotic cells alike? How do they differ?

7.2 Cell Structure

Understand Key Concepts

7. In eukaryotic cells, chromosomes carrying genetic information are found in the
 - a. ribosomes.
 - b. lysosomes.
 - c. nucleus.
 - d. cell membrane.
8. The organelles that break down lipids, carbohydrates, and proteins into small molecules that can be used by the cell are called
 - a. vacuoles.
 - b. lysosomes.
 - c. ribosomes.
 - d. microfilaments.

9. Cell membranes contain a central bilayer formed by
 - a. lipids.
 - b. protein pumps.
 - c. carbohydrates.
 - d. proteins.
10. Draw a cell nucleus. Label and give the function of the following structures: chromatin, nucleolus, and nuclear envelope.
11. What is the function of a ribosome?
12. Describe the role of the Golgi apparatus.

Think Critically

13. **Infer** The pancreas, an organ present in certain animals, produces enzymes used elsewhere in the animals' digestive systems. Which type of cell structure(s) might produce those enzymes? Explain your answer.
14. **© Craft and Structure** For each of the following, indicate if the structure is found only in eukaryotes, or if it is found in eukaryotes and prokaryotes: cell membrane, mitochondria, ribosome, Golgi apparatus, nucleus, cytoplasm, and DNA.

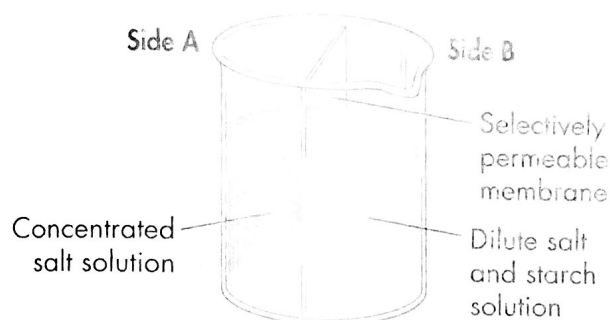
7.3 Cell Transport

Understand Key Concepts

15. The movement of water molecules across a selectively permeable membrane is known as
 - a. exocytosis.
 - b. phagocytosis.
 - c. endocytosis.
 - d. osmosis.
16. A substance that moves by passive transport tends to move
 - a. away from the area of equilibrium.
 - b. away from the area where it is less concentrated.
 - c. away from the area where it is more concentrated.
 - d. toward the area where it is more concentrated.
17. **© Text Types and Purposes** Describe the process of diffusion, including a detailed explanation of equilibrium.
18. **© Craft and Structure** What is the relationship between diffusion and osmosis? By definition, what's the only substance that undergoes osmosis?
19. **© Craft and Structure** What is the difference between passive transport and active transport?

Think Critically

20. **Predict** The beaker in the diagram below has a selectively permeable membrane separating two solutions. Assume that both water and salt can pass freely through the membrane. When equilibrium is reached, will the fluid levels be the same as they are now? Explain.



21. **© Craft and Structure** What would happen to a sample of your red blood cells if they were placed in a hypotonic solution? Explain.
22. **Design Experiments** You are given food coloring and three beakers. The first beaker contains water at room temperature, the second beaker contains ice water, and the third beaker contains hot water. Design a controlled experiment to determine the effects of temperature on the rate of diffusion. Be sure to state your hypothesis.

solve the CHAPTER MYSTERY

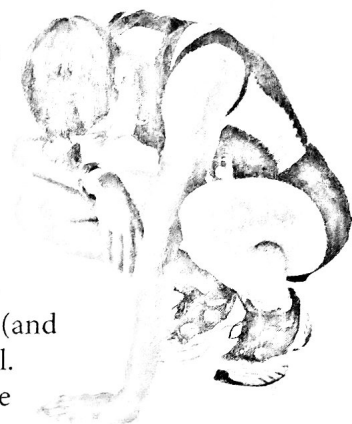
DEATH BY ... WATER?

During the race, Michelle drank plenty of water, but she didn't replace the salts she lost due to sweating. As a result, her blood became hypotonic, and osmotic pressure led the cells in her brain (and throughout her body) to swell.

As Michelle's blood became more dilute, cells in her brain sent chemical signals to her kidneys to stop removing sodium chloride and other salts from her bloodstream. However, as she continued to sweat, she continued to lose salt through her skin.

By the end of the race, Michelle had lost a large quantity of salt and minerals and had taken in so much water that homeostasis had broken down, and her cells were damaged by unregulated osmotic pressure.

When Michelle was rushed to the hospital, the doctors discovered that she was suffering from hyponatremia, or water intoxication. Left untreated, this condition can lead to death.



7.4 Homeostasis and Cells

Understand Key Concepts

23. Which of the following is true of ALL single-celled organisms?
- They are all prokaryotes.
 - They are all bacteria.
 - They all reproduce.
 - They all have a nucleus.
24. A tissue is composed of a group of
- similar cells.
 - related organelles.
 - organ systems.
 - related organs.
25. **© Craft and Structure** Explain the relationship among cell specialization, multicellular organisms, and homeostasis.
26. **© Craft and Structure** Describe the relationship among cells, tissues, organs, and organ systems.

1. **Relate Cause and Effect** When a person sweats, water and essential solutes called electrolytes are lost from body fluid. Michelle drank lots of water but did not replace lost electrolytes. What effect did this have on her cells?
2. **Infer** Had Michelle alternated between drinking water and a sports drink with electrolytes would her condition be the same?
3. **Infer** Do you think that hyponatremia results from osmosis or active transport? Explain your reasoning.
4. **Connect to the Big Idea** Explain how hyponatremia disrupts homeostasis in the body.