



Name _____

Period _____

Date _____

SECTION
3.1

CELL THEORY
Study Guide

KEY CONCEPT

Cells are the basic unit of life.

VOCABULARY

cell theory

organelle

eukaryotic cell

cytoplasm

prokaryotic cell

MAIN IDEA: Early studies led to the development of the cell theory.

In a phrase, tell what each scientist did to help develop the cell theory.

Scientist	Contribution to Cell Theory
1. Hooke	
2. Leeuwenhoek	
3. Schleiden	
4. Schwann	
5. Virchow	

6. What are the three parts of the cell theory?

7. Give two reasons why the cell theory is important.

Section 3.1 STUDY GUIDE CONTINUED

MAIN IDEA: Prokaryotic cells lack a nucleus and most internal structures of eukaryotic cells.

In the top left side of the Y shape below, write the characteristics of eukaryotic cells. In the top right side of the Y shape below, write the characteristics of prokaryotic cells. At the bottom of the Y shape below, write the characteristics that both kinds of cells have in common. Then lightly cross out those characteristics at the top of the Y.

Eukaryotic cells	Prokaryotic cells
_____	_____
_____	_____
_____	_____
_____	_____
Both	

Vocabulary Check

8. What is cytoplasm?

9. Where do you find organelles?

10. What statements summarize scientists' concepts of cells?

11. Which type of cells have no nucleus?



Name _____

Period _____

Date _____

SECTION
3.2

CELL ORGANELLES
Study Guide

KEY CONCEPT

Eukaryotic cells share many similarities.

VOCABULARY

cytoskeleton	Golgi apparatus	lysosome
nucleus	vesicle	centriole
endoplasmic reticulum	mitochondrion	cell wall
ribosome	vacuole	chloroplast

MAIN IDEA: Cells have an internal structure.

1. Look at Figure 3.5 in your textbook. What are the functions of a cytoskeleton?

2. How is a cytoskeleton like your skeleton?

3. How is a cytoskeleton like your muscles?

MAIN IDEA: Several organelles are involved in making and processing proteins.

Write either the function or the name of each organelle. Draw a sketch to help you remember it.

Organelle	Function	Sketch
4. nucleus		
5.	helps in the production of proteins and lipids	
6. ribosomes		
7. Golgi apparatus		
8.	carries certain molecules from place to place within a cell	

Copyright by McDougal Littell, a division of Houghton Mifflin Company

Section 3.2 STUDY GUIDE CONTINUED

MAIN IDEA: Other organelles have various functions.

Write the function of each organelle. Draw a sketch to help you remember it.

Organelle	Function	Sketch
9. mitochondrion		
10. vacuole		
11. lysosome		
12. centriole		

MAIN IDEA: Plant cells have cell walls and chloroplasts.

13. What role do cell walls play in a plant?

14. What is the difference between a cell wall and a cell membrane?

15. Why are chloroplasts important?

Vocabulary Check

16. Which cell part is a maze of folded membranes where proteins and lipids are produced?

17. Which cell part converts food into energy that is usable by a cell?



Name _____

Period _____

Date _____

SECTION
3.3

CELL MEMBRANE
Study Guide

KEY CONCEPT

The cell membrane is a barrier that separates a cell from the external environment.

VOCABULARY

cell membrane	selective permeability
phospholipid	receptor
fluid mosaic model	

MAIN IDEA: Cell membranes are composed of two phospholipid layers.

1. Draw a phospholipid in the box below. Label the three major parts.

2. Which part of a phospholipid is charged, or polar? _____
3. Which part of a phospholipid is nonpolar? _____
4. What type of molecules interact with water, polar or nonpolar? _____
5. Where does a cell membrane come into contact with water? _____
6. Why do the phospholipids surrounding the cell form a bilayer? _____

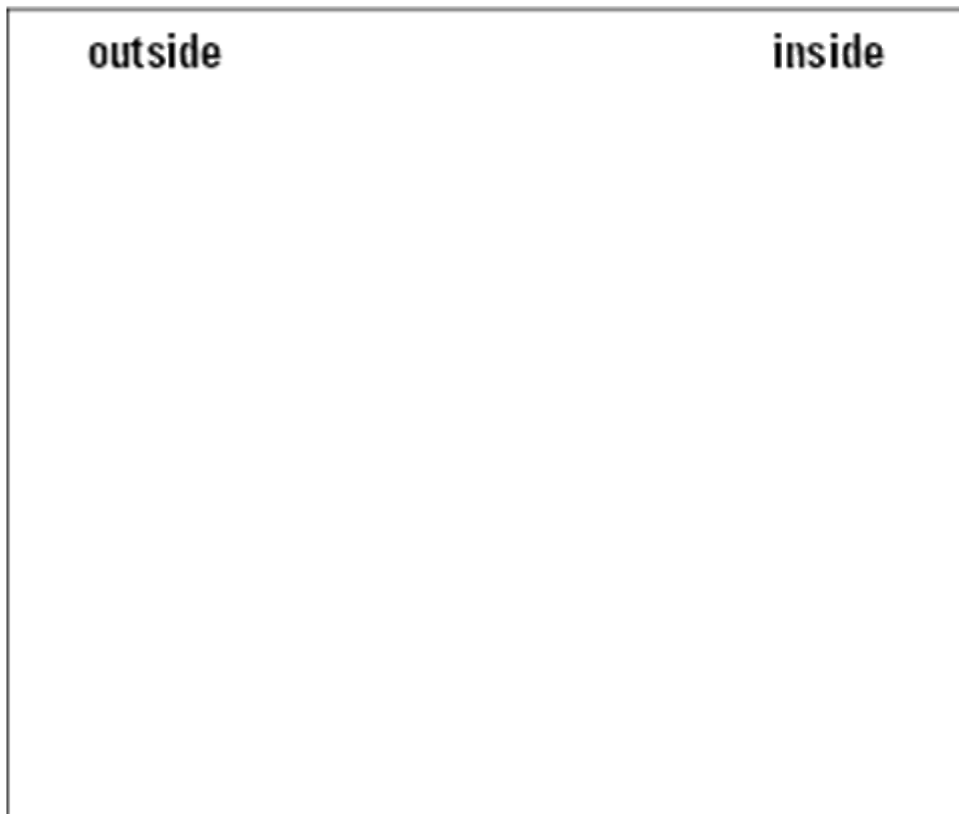
Section 3.3 STUDY GUIDE CONTINUED

A cell membrane has other types of molecules embedded in the phospholipid bilayer. List a function of each type of molecule in the table below.

Molecule	Function
7. Cholesterol	
8. Proteins	
9. Carbohydrates	

10. In what way is a membrane fluid?

11. Draw a picture in the box below to represent selective permeability.



Section 3.3 STUDY GUIDE CONTINUED

MAIN IDEA: Chemical signals are transmitted across the cell membrane.

- 12.** A _____ detects a signal molecule and carries out an action in response.
- 13.** A _____ is a molecule that acts as a signal when it binds to a receptor.
- 14.** A ligand that can cross the cell membrane can bind to an _____ receptor.
- 15.** A ligand that cannot cross the cell membrane can send a message to a cell by binding to a _____ receptor, which then _____ shape.

Vocabulary Check

- 16.** What is the fluid mosaic model?

- 17.** The cell membrane allows some, but not all, molecules to cross. What term describes this property?



Name _____

Period _____

Date _____

SECTION
3.4

DIFFUSION AND OSMOSIS

Study Guide

KEY CONCEPT

Materials move across membranes because of concentration differences.

VOCABULARY

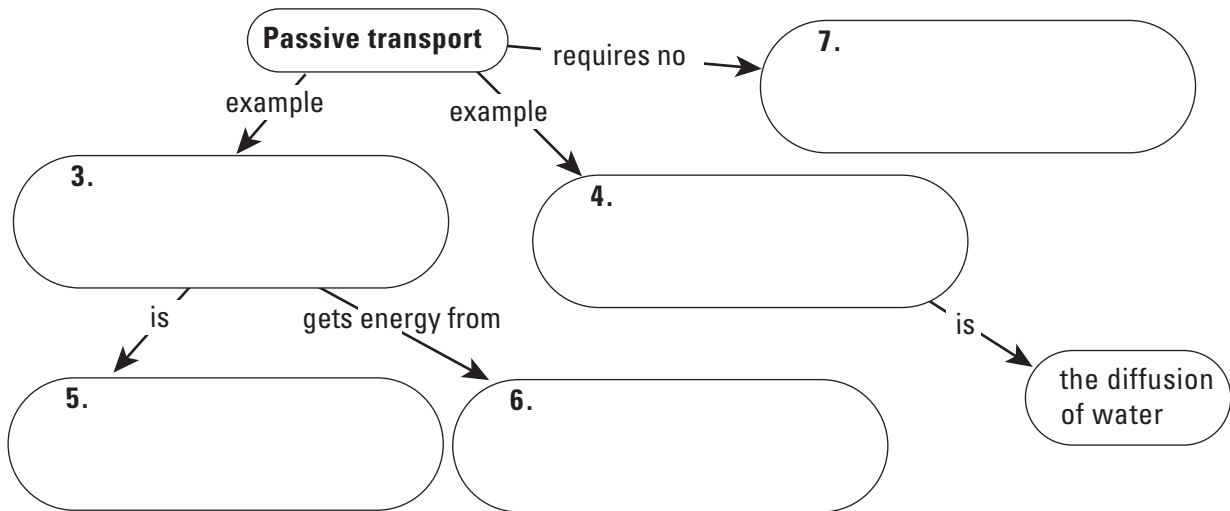
passive transport	osmosis	hypotonic
diffusion	isotonic	facilitated diffusion
concentration gradient	hypertonic	

MAIN IDEA: Diffusion and osmosis are types of passive transport.

1. What is a concentration gradient?

2. What does it mean for a molecule to diffuse down a concentration gradient?

Complete the concept map below about passive transport.



8. The higher the concentration of dissolved particles in a solution, the _____ the concentration of water molecules in that solution.

Section 3.4 STUDY GUIDE CONTINUED

Suppose you have three solutions with different concentrations of particles. Relative to the concentration of particles in a cell, one solution is isotonic, one is hypertonic, and one is hypotonic. Use this information to answer the next two questions.

9. Which solution has the highest concentration of particles?

10. Which solution has the highest concentration of water molecules?

MAIN IDEA: Some molecules diffuse through transport proteins.

11. How does facilitated diffusion differ from simple diffusion?

12. In facilitated diffusion, do molecules move down a concentration gradient or against a concentration gradient?

Vocabulary Check

13. The difference in the concentration of a substance from one location to another is a

14. People with excess energy are described as hyper. How does this relate to the meaning of hypertonic?

15. The word *facilitate* means “to make easier.” How does this meaning apply to facilitated diffusion?



Name _____

Period _____

Date _____

SECTION
3.5

ACTIVE TRANSPORT, ENDOCYTOSIS, AND EXOCYTOSIS

Study Guide

KEY CONCEPT

Cells use energy to transport materials that cannot diffuse across a membrane.

VOCABULARY

active transport	phagocytosis
endocytosis	exocytosis

MAIN IDEA: Proteins can transport materials against a concentration gradient.

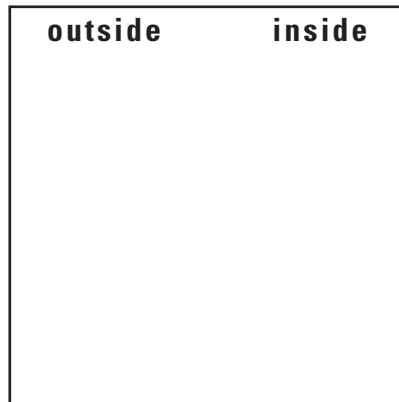
1. How is active transport different than simple diffusion and facilitated diffusion?

2. How is active transport similar to facilitated diffusion?

3. List two characteristics that almost all transport proteins share.

4. List the key distinguishing feature of active transport proteins.

5. Refer to Figure 3.25 to draw a picture in the box below to represent active transport.



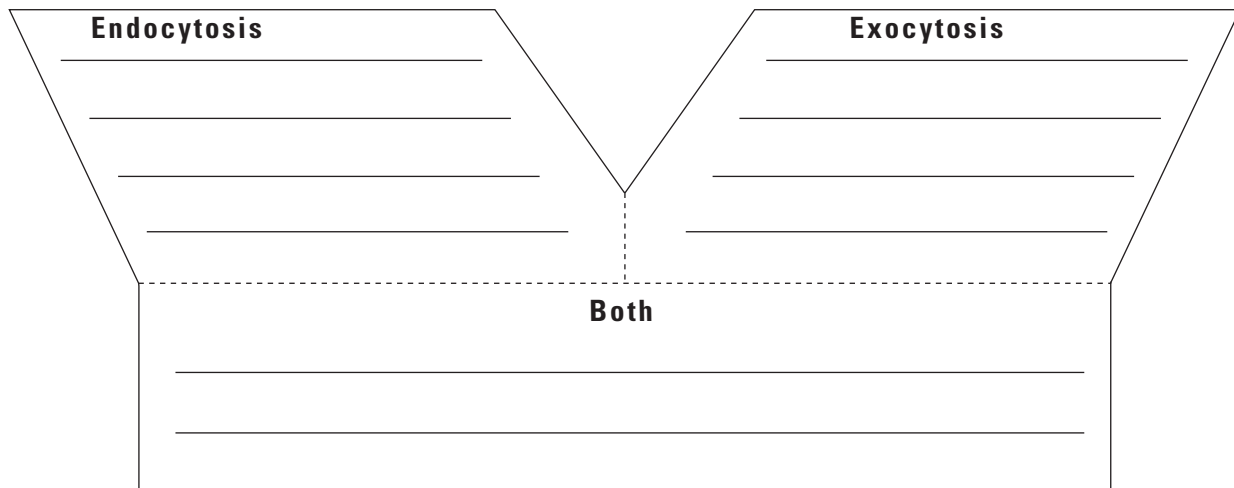
6. Most active transport proteins use energy from the breakdown of _____.

Section 3.5 STUDY GUIDE CONTINUED

MAIN IDEA: Endocytosis and exocytosis transport materials across the membrane in vesicles.

7. A cell may transport a substance in _____ if the substance is too large to cross the membrane.
8. During endocytosis, the vesicle membrane fuses with a lysosome, and the membrane and its contents are broken down by _____.

Complete the Y diagram below to compare and contrast the processes of endocytosis and exocytosis. Under the heading “endocytosis,” list the characteristics of endocytosis. Under the heading “exocytosis,” list the characteristics of exocytosis. At the bottom of the Y, write the characteristics that both processes have in common. Then lightly cross out those characteristics at the top of the Y.



Vocabulary Check

9. What term means “cell eating” and describes a type of endocytosis?

10. The prefix *exo-* means “out of,” and the prefix *endo-* means “taking in.” How do these meanings relate to the meaning of exocytosis and endocytosis?

11. What process drives molecules across a membrane against a concentration gradient?
