Name _____ Date _____ Class _____

CHAPTER 3 DIRECTED READING

Cell Structure

▶ Section 3-1: Looking at Cells

Microscopes Reveal Cell Structure

Mark each statement below T *if it is true or* F *if it is false.*

_____ **1.** A large dog is approximately 2 m tall.

_____ **2.** A dime is approximately 6 cm in diameter.

_____ **3.** A blood cell is about 0.1 mm long.

_____ **4.** A meter is approximately 3 ft.

_____ **5.** A light microscope can be used to view objects as small as 1 nm.

In the space provided, explain how the terms in each pair differ in meaning.

6. magnification, resolution

_____

_____

7. light microscope, electron microscope

_____

_____

Microscopes Have Different Uses and Limitations

Read each question, and write your answer in the space provided.

8. What is the difference between a magnifying glass and a compound light microscope?

_____

_____

_____

9. What is the difference between a transmission electron microscope and a scanning electron microscope?

_____

_____

_____

▶ Section 3-2: Cell Features

The Cell Theory Has Three Parts

Mark each statement below T *if it is true or* F *if it is false.*

_____ **1.** All organisms are made of many cells.

_____ **2.** The cell membrane prevents all substances from entering the cell and leaving the cell.

_____ **3.** Cells arise from existing cells.

_____ **4.** All cells contain ribosomes.

_____ **5.** If a cell's surface-area-to-volume ratio is too high, substances cannot move through the cell quickly enough to meet the cell's needs.

_____ **6.** The structures inside a cell are suspended in a system of microscopic fibers called the cytoplasm.

Prokaryotes Do Not Contain Internal Compartments

Read each question, and write your answer in the space provided.

7. What are prokaryotes?

_____

_____

8. What is the difference between flagella and cell walls?

_____

_____

_____

9. How are cell walls important to bacterial cells?

_____

_____

_____

Eukaryotic Cells Are Organized

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **10.** eukaryote

_____ **11.** organelles

_____ **12.** nucleus

_____ **13.** cilia

a. short hairlike structures

b. cell structures that carry out specific activities

c. houses the cell's DNA

d. cells contain nuclei

The Structure and Function of Cell Membranes Are Closely Related

Complete each statement by writing the correct term or phrase in the space provided.

14. The _____ of a phospholipid is polar, and the long _____ are nonpolar.

15. The _____ _____ is made of a double layer of phospholipids.

Read each question, and write your answer in the space provided.

16. What keeps proteins within the lipid bilayer?

_____

_____

17. What are the functions of the cell membrane?

_____

_____

In the space provided, write the letter of the description that best matches the term or phrase.

_____ 18. cell-surface marker

_____ 19. receptor protein

_____ 20. enzyme

_____ 21. transport protein

a. assists chemical reactions inside the cell
b. recognizes and binds to substances outside the cell
c. helps substances move across the cell membrane
d. identifies cell type

▶ Section 3-3: Cell Organelles

The Nucleus Directs Cell Activities and Stores DNA

Read each question, and write your answer in the space provided.

1. What two substances are made in the nucleus and move into the cytoplasm?

_____

_____

2. What substance is stored in the nucleus?

_____

_____

An Internal Membrane System Processes Proteins

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **3.** endoplasmic reticulum

_____ **4.** Golgi apparatus

_____ **5.** vesicle

_____ **6.** lysosomes

_____ **7.** rough ER

_____ **8.** smooth ER

_____ **9.** ribosomes

a. packages and distributes proteins
b. small membrane-bound sac
c. internal membranes that move substances through the cell
d. small organelles that contain digestive enzymes
e. cellular structures on which proteins are made
f. does not have attached ribosomes
g. has attached ribosomes

Mitochondria Produce ATP

Read each question, and write your answer in the space provided.

10. What is ATP?

_____

_____

11. What function do mitochondria perform?

_____

_____

Plant Cells Contain Structures That Animal Cells Lack

In the space provided, write Plants *if the structure is found in plant cells, or* Animals *if the structure is found in animal cells. Write* Both *if the structure is found in both plant cells and animal cells.*

_____ **12.** cell membrane

_____ **13.** ribosomes

_____ **14.** nucleus

_____ **15.** cell wall

_____ **16.** mitochondria

_____ **17.** chloroplasts

_____ **18.** central vacuole

Name _____ Date _____ Class _____

CHAPTER 4 DIRECTED READING

Cells and Their Environment

▶ Section 4-1: Passive Transport

Diffusion Is Caused by the Random Movement of Particles

Read each question, and write your answer in the space provided.

1. What is passive transport? Why is diffusion an example of passive transport?

2. How does the cell membrane help cells maintain homeostasis?

3. What determines the direction in which a substance diffuses across a membrane?

4. Describe the state of equilibrium.

Water Diffuses into and out of Cells by Osmosis

In the space provided, explain how the terms in each pair differ in meaning.

5. osmosis, diffusion

6. hypertonic solution, hypotonic solution

7. isotonic solution, equilibrium

Proteins Help Some Substances Cross the Cell Membrane

Mark each statement below T ***if it is true or*** F ***if it is false.***

_____ **8.** Most polar molecules cannot cross cell membranes without the help of certain proteins.

_____ **9.** An ion channel is a selectively permeable protein with a pore.

_____ **10.** The pores of ion channels are always open.

_____ **11.** Carrier proteins require cells to expend energy when they transport substances across a cell membrane.

_____ **12.** Carrier proteins are used in a process called facilitated diffusion.

_____ **13.** Ion channels do not depend on concentration gradients to move ions and polar molecules across a cell membrane.

_____ **14.** Random motion causes the movement of ions through ion channels.

▶ Section 4-2: Active Transport

Some Substances Are Transported Against a Concentration Gradient

Complete each statement by writing the correct term or phrase in the space provided.

1. The transport of a substance across the cell membrane against its concentration gradient is called _____ _____.
2. Active transport requires the cell to use _____.
3. The energy needed for active transport is usually supplied by _____.
4. The sodium-potassium pump is a(n) _____ _____.

5. The concentration of sodium ions inside the cell is usually _____ than the concentration of sodium ions outside the cell.

6. The concentration of potassium ions inside the cell is usually _____ than the concentration of potassium ions outside the cell.

7. The sodium-potassium pump picks up _____ ions outside the cell.

8. The sodium-potassium pump releases _____ ions inside the cell.

Vesicles Move Substances Across Membranes

Read each question, and write your answer in the space provided.

9. Explain why proteins and polysaccharides cannot enter and leave cells through membrane proteins.

10. What is the difference between endocytosis and exocytosis?

11. How is a vesicle formed in endocytosis?

12. What happens to a vesicle in exocytosis?

13. How do sodium-potassium pumps support the efficient functioning of cells?

Membrane Receptor Proteins Receive Information

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **14.** signal molecule

_____ **15.** receptor protein

_____ **16.** ion channel

_____ **17.** second messenger

_____ **18.** enzyme action

_____ **19.** beta blocker

_____ **20.** changes in permeability

a. a large protein in the cell membrane that transports a specific ion

b. acts as a signal molecule in the cytoplasm

c. a protein that binds to a specific signal molecule

d. speeds up chemical reactions in the cell

e. a drug that interferes with the binding of signal molecules to receptor proteins in heart muscles

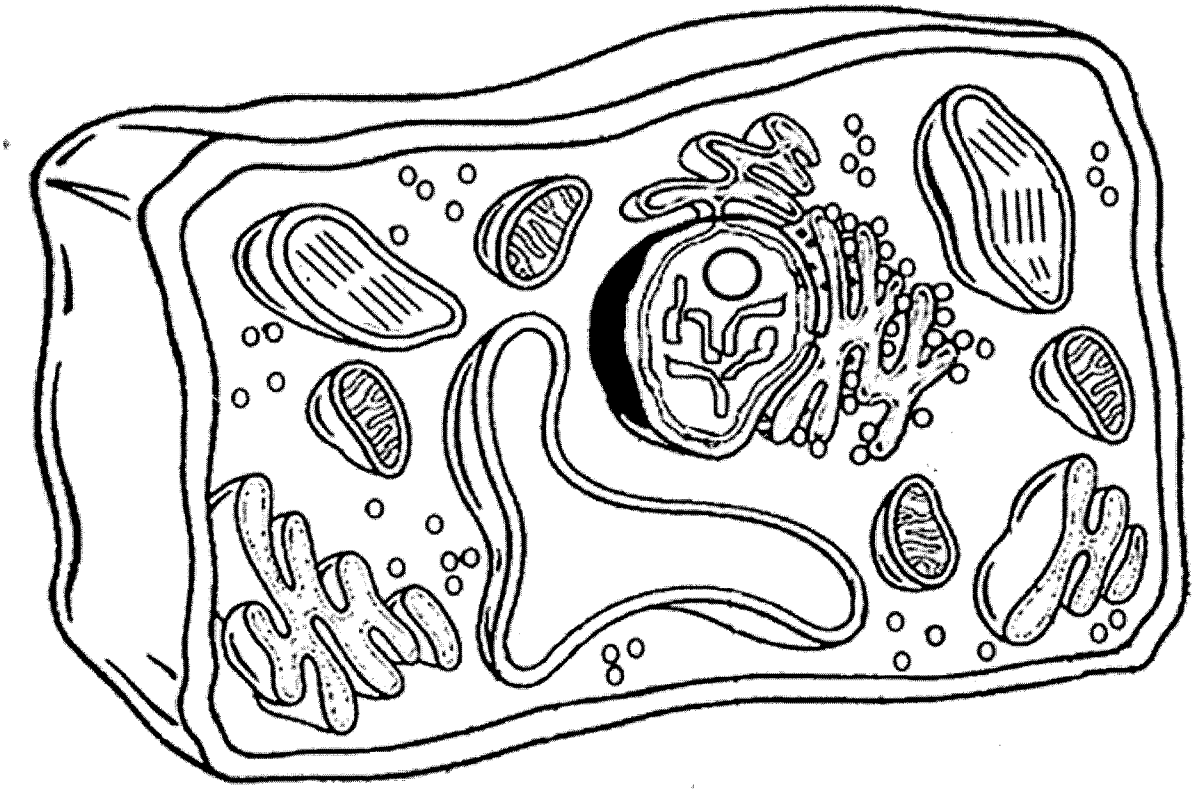
f. carries information throughout the body and to other cells

g. occur when a receptor protein is coupled with an ion channel

Name:_____

Plant Cell Coloring

- ☐ Cell Membrane (orange)
- ☐ Nucleoplasm (yellow)
- ☐ Mitochondria (red)
- ☐ Vacuole (lt. Blue)
- ☐ Chromatin (gray)
- ☐ Cell Wall (dark green)
- ☐ Nucleolus (brown)
- ☐ Chloroplasts (light green)
- ☐ Smooth Endoplasmic Reticulum (pink)
- ☐ Rough Endoplasmic Reticulum (pink)
- ☐ Ribosome (purple)
- ☐ Cytoplasm (white)
- ☐ Golgi Apparatus (dk blue)



Analysis

1. Name two things found in a plant cell that are not found in an animal cell:
2. How does the shape of a plant cell differ from that of an animal cell?
3. What is the function of the chloroplasts?
4. What is the function of the vacuole?

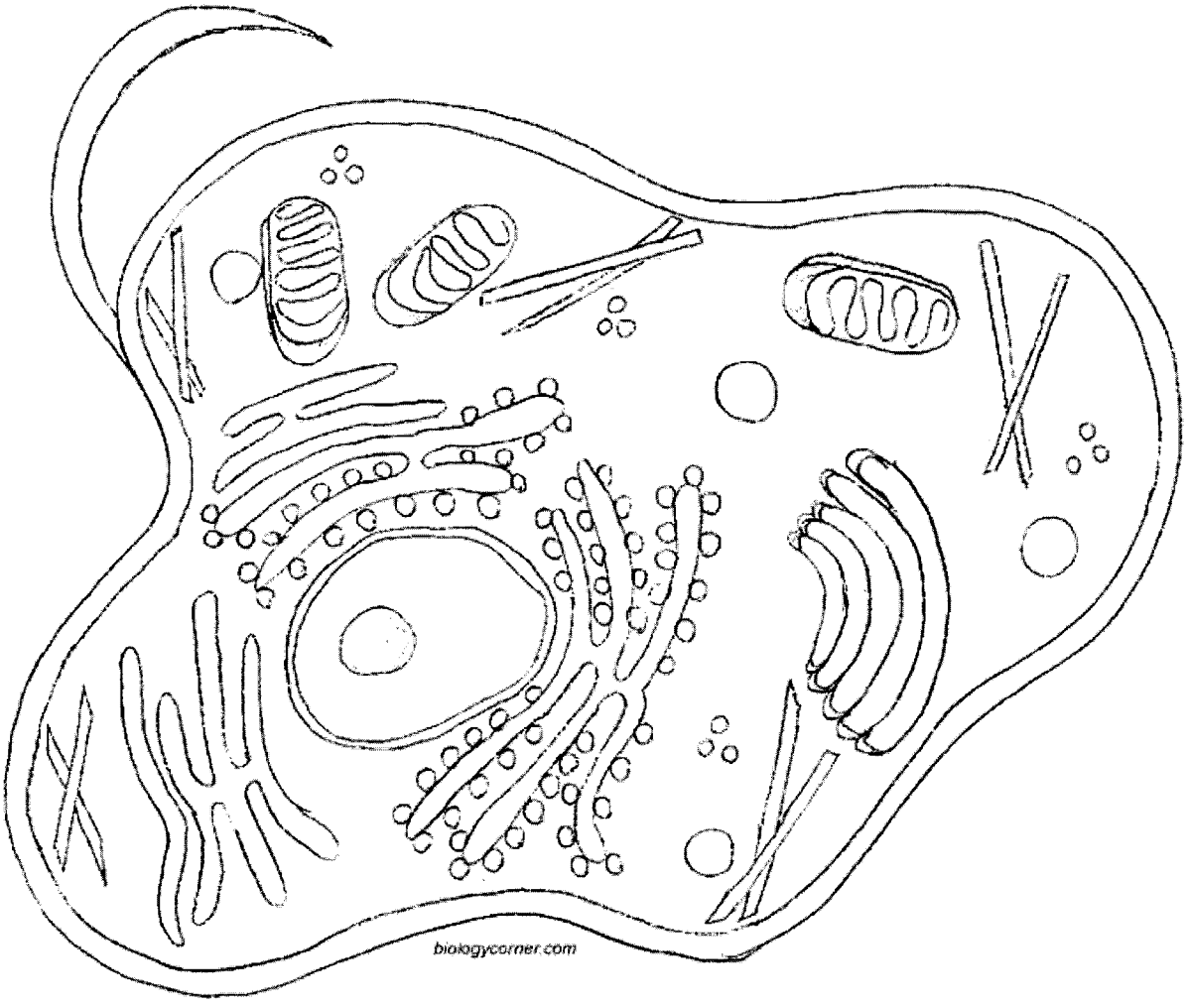
Name:_____

3

Animal Cell Coloring

I. Directions: Color each part of the cell its designated color.

Cell Membrane(light brown) ☐
Cytoplasm (light yellow) ☐
Nucleoplasm (pink) ☐
Nuclear Membrane(dark brown) ☐
Nucleolus (black) ☐
Golgi Apparatus (pink) ☐
Flagella (red/blue striped) ☐
Rough Endoplasmic Reticulum (dark blue) ☐
Smooth Endoplasmic Reticulum(light blue) ☐
Mitochondria (orange) ☐
Lysosome (purple) ☐
Microtubules (dark green) ☐
Ribosome (red) ☐



II. Briefly describe the function of the cell parts.

1. Cell membrane _____
2. Endoplasmic Reticulum _____
3. Ribosome _____
4. Golgi Apparatus _____
5. Lysosome _____
6. Microtubule _____