

Chapter Resources

Cells—The Units of Life

Includes:

Reproducible Student Pages

ASSESSMENT

- ✓ Chapter Tests
- ✓ Chapter Review

HANDS-ON ACTIVITIES

- ✓ Lab Worksheets for each Student Edition Activity
- ✓ Laboratory Activities
- ✓ Foldables—Reading and Study Skills activity sheet

MEETING INDIVIDUAL NEEDS

- ✓ Directed Reading for Content Mastery
- ✓ Directed Reading for Content Mastery in Spanish
- ✓ Reinforcement
- ✓ Enrichment
- ✓ Note-taking Worksheets

TRANSPARENCY ACTIVITIES

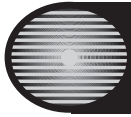
- ✓ Section Focus Transparency Activities
- ✓ Teaching Transparency Activity
- ✓ Assessment Transparency Activity

Teacher Support and Planning

- ✓ Content Outline for Teaching
- ✓ Spanish Resources
- ✓ Teacher Guide and Answers



Glencoe



Overview

Cells—The Units of Life

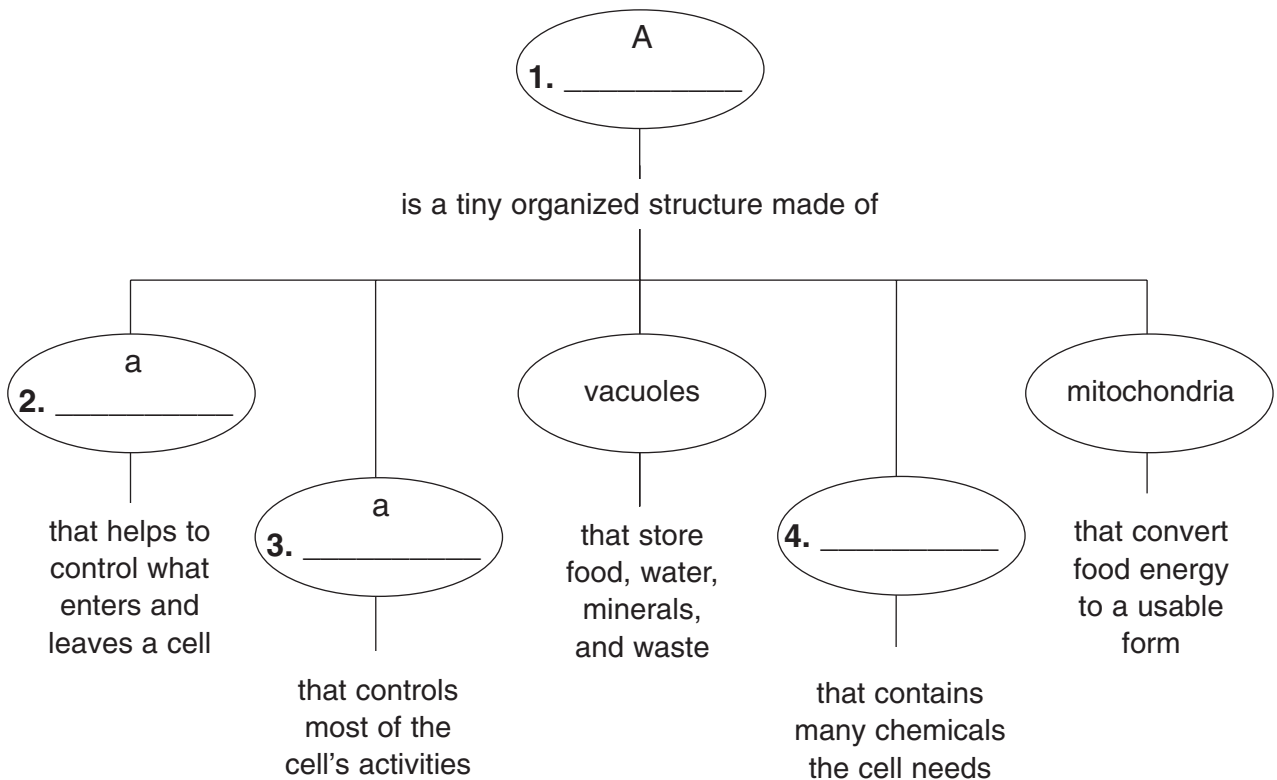
Directions: Complete the concept map using the terms in the list below.

cell

nucleus

cell membrane

cytoplasm



Directions: The terms below show the levels of organization in a living thing. On the following lines, write these levels in order from simplest to most complex.

organ system
organism

tissue

cell
organ

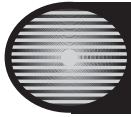
5. _____
simplest

6. _____

7. _____

8. _____

9. _____
most complex



Directed Reading for
Content Mastery

Section 2 ■ The Different Jobs of Cells

Directions: Match the terms in Column II with the definitions in Column I. Write the letter of the correct term in the blank at the left.

Column I

- _____ 1. groups of similar cells doing the same work
- _____ 2. Each type of cell has a specific _____.
- _____ 3. organs working together
- _____ 4. a long-branched type of cell that sends messages quickly
- _____ 5. cell surrounded by calcium and phosphorous
- _____ 6. Cells in many celled organisms are _____.
- _____ 7. the smallest living unit in the body
- _____ 8. two or more different types of tissues working together

Column II

- a. organ system
- b. cell
- c. organ
- d. tissues
- e. nerve cell
- f. bone cell
- g. specialized
- h. job

Directions: Complete the following sentences using the terms listed below.

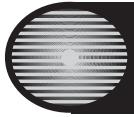
skin

leaf

muscle

plants

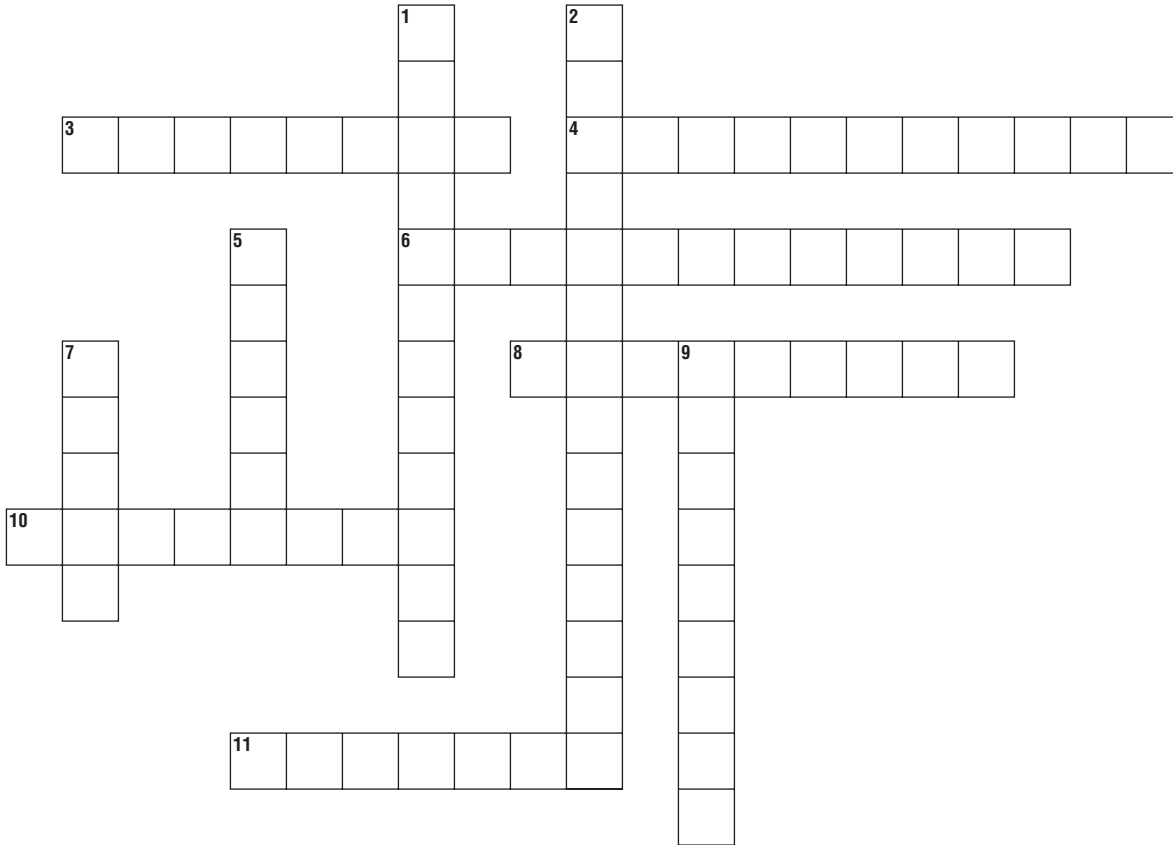
- 9. Long, tubelike cells move water, food, and other materials through _____.
- 10. _____ cells have long fibers that can contract and relax.
- 11. _____ cells are flat and close together, forming a protective layer over your body.
- 12. Some _____ cells are brick-shaped and contain many chloroplasts.



Key Terms

Cells—The Units of Life

Directions: Use the clues below to complete the crossword puzzle.



Across

3. The outer, supportive structure of a plant cell
4. A group of organs
6. The energy-producing units of a cell
8. A gelatinlike substance that has chemicals for the cell's needs
10. Single-celled organisms without a nucleus
11. Controls most of the cell's activities

Down

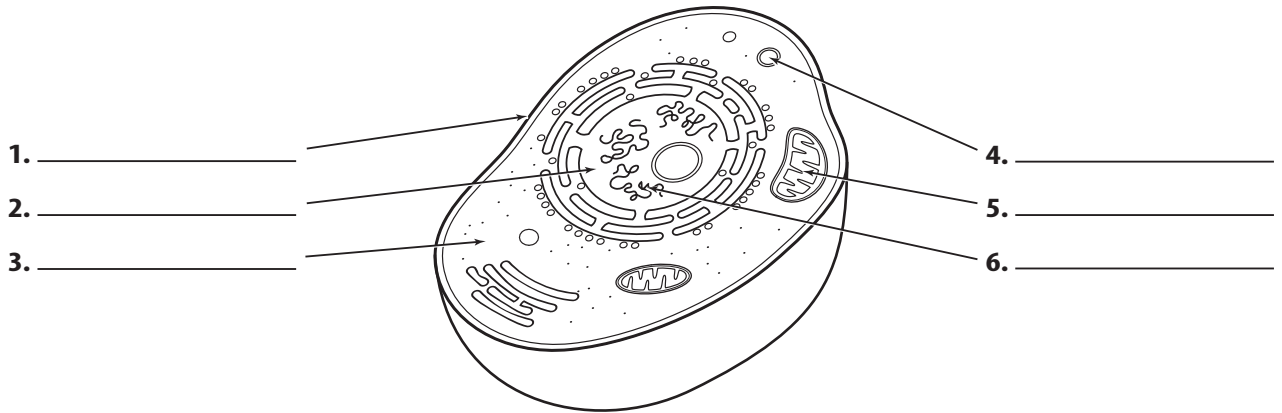
1. Flexible structure that holds cell together
2. The process of capturing energy and converting it to food in the chloroplasts
5. Group of similar cells that all do the same work
7. Two or more different types of tissue working together
9. Performs activities necessary for the cell's life

SECTION
1

Reinforcement

The World of Cells

Directions: Study the following diagram. Then identify each part of the animal cell by filling in each blank.



Directions: Answer the following questions on the lines provided.

7. What important process takes place inside a cell's mitochondria?

8. What is the function of a cell membrane?

9. What organelles do plant cells have that animal cells do not?

10. How have scientists learned so much about cells in the last 300 years?

Directions: Write the correct term in the space beside each definition.

_____ 11. a gelatinlike substance that fills the inside of a cell

_____ 12. where the hereditary material of the cell is held, except in bacteria

_____ 13. a place for storage inside the cell

_____ 14. the outer support and protective structure of a plant cell


 SECTION
2
Reinforcement

Reinforcement

The Different Jobs of Cells

Directions: Match the description in the first column with the item in the second column by writing the correct letter in the space.

- | | |
|---|-----------------|
| _____ 1. a group of organs working together | a. organ system |
| _____ 2. what a cell's shape and size is related to | b. tissue |
| _____ 3. group of similar cells that all do the same work | c. function |
| _____ 4. two or more types of tissue working together | d. organ |

Directions: Complete the following sentences using the correct terms.

- Cells are _____ into systems that work together to keep an organism alive.
- The tongue, stomach, and intestines make up part of an organ _____.
- An organism that contains more than one cell is called a(n) _____ organism.
- Plant cells help move _____, _____, and other materials throughout a plant.

Directions: Unscramble the terms in italics to complete the sentences below. Write the terms on the lines provided.

- _____ 9. Cells in a tissue or organ work *tergheto* to keep an organism alive.
- _____ 10. The *yiretporsra* system is one of several organ systems in your body.
- _____ 11. Your bones move from contracting *lecsmu* tissue.
- _____ 12. Groups of similar cells that do the same sort of work are *sesitus*.
- _____ 13. Different tissues working together form a(n) *rango*.

Directions: Answer the following questions on the lines provided.

- Describe the various tissues in the stomach and what they do.

- How many muscles make up the muscular system, and what do they do?

SECTION
1

Enrichment

How Many-Celled Organisms Might Have Begun

Fossil evidence suggests that life began on Earth as one-celled organisms. Between 540 and 700 million years ago (the late Precambrian Era), these one-celled organisms began evolving into many-celled organisms. The many-celled organisms consisted of groups of specialized cells that performed different tasks. Scientists continue to debate why this change began to happen, but one recent study points to a likely explanation.

Safety in Numbers

Researcher Martin Boraas at the University of Wisconsin in Milwaukee developed an experiment to test one popular hypothesis of how many-celled organisms evolved. The assumption of the study was that one-celled organisms began grouping together as protection from other predatory one-celled organisms. When grouped together for protection, the colony of cells became too big to be ingested.

To test this hypothesis, Boraas and his team injected predatory one-celled organisms into cultures of one-celled algae. After the cultures were injected with the predators, the algal cells began forming groups from just a few cells to hundreds of cells.

The cells that remained alone began to decline in number, while the groups of cells continued to thrive. Over time, the algal colonies began to form in groups of mostly eight cells. Normally, cell walls of one-celled organisms living in groups separate when the cells divide, but in the case of the eight-celled groups, the walls remained intact to hold the colony together. This enabled the colonies to replicate as eight-celled groups rather than as individual cells.

A Starting Point

The researchers were able to conclude that the cells did indeed remain grouped together for protection from predators. The scientists also pointed out that the colonies settled into patterns of eight cells instead of larger groups because that pattern allowed them to have maximum exposure to external nutrients while still remaining in a group. Boraas and his team determined that similar reactions might have been the first step in the evolution of many-celled life forms hundreds of millions of years ago.

1. What did the study prove about one-celled organisms?

2. What sort of changes would have to occur in a group of one-celled organisms to form one many-celled organism?

3. In your opinion, why is studying the behavior of cells important?

SECTION
2

Enrichment

Organ and Tissue Donation

In 2001, more than 72,000 Americans needed some kind of organ transplant. Statistics show that in the 1990s, more people needed transplants than there were donors. This trend continues today. Each month, more than 2,000 names are added to the United Network for Organ Sharing (UNOS) national organ transplant waiting list. But only 5,000 to 7,000 people who die each year become donors—just about half of the people who could become donors. Nearly 25 different organs and tissues can be transplanted, including bone marrow, corneas, skin, lungs, hearts, kidneys, small intestines, pancreases, and livers.

Who Can Donate

Donors usually are people in good health who die suddenly. These patients must be declared legally “brain dead” before their organs can be taken. “Brain dead” is a medical term that means a person’s brain no longer works. However, the person’s heart and lungs can keep working with the help of machines. Donors may also be living. For example, a person can donate bone marrow or a kidney and still live a normal life.

Donors can be any age—from newborns to senior citizens. Donors are matched to recipients through the UNOS National Organ Procurement and Transplantation Network, a national computer database.

Blood type, body size, and the length of time on the waiting list are taken into account when making a donor match. One donor can give many organs to several different people. In fact, a single tissue donor can help up to 50 people by donating heart valves, bones, connective tissues, and so on.

How To Donate

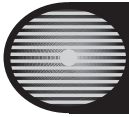
Signing a donor card or a form on your driver’s license are ways to become an organ donor. However, since family members are responsible for signing the actual consent form at the time of death, people wishing to become donors should let family members know. Hospitals are required by law to tell family members about organ donation and ask if they want to sign a consent form.

Although organ transplants are more common than ever, they’re not without risk. A recipient’s body can reject the organ. However, success rates are higher, thanks to improved surgical techniques and advancements in anti-rejection pharmaceuticals. Kidney recipients have a very high survival rate one year after surgery. So do pancreas recipients. Some kidney recipients have lived more than 20 years following transplant surgery. A 1997 study by the Department of Health and Human Services says that one-year transplant survivors have “excellent long-term prospects.”

1. Why do you suppose more people have received organ transplants in the past 10 or so years?

2. List as many reasons as you can for why you think there is a shortage of organ and tissue donors.

3. Why would machines be used to keep the heart and lungs working in a brain dead patient?



Note-taking Worksheet

Cells—The Units of Life

Section 1 The World of Cells

- A. _____ help living creatures with activities of life such as movement, growth, and reproduction.
- The _____ was developed after Robert Hooke invented the microscope in 1665.
 - All _____ things are made of one or more cells.
 - The cell is the _____ of life.
 - All cells come from cells that already _____.
 - _____ are one-celled organisms; larger organisms are made of many cells, sometimes trillions of cells.
 - A microscope's _____ is found by multiplying the powers of the eyepiece and the objective lens.
- B. Cells are composed of parts that do _____ jobs.
- The flexible _____ is the boundary of the cell and helps control what enters and exits the cell; some cells have a **cell wall** that helps support and protect the cell.
 - _____ is a gelatinlike substance containing many chemicals the cell needs.
 - Specialized cell parts called _____ do various jobs within a cell.
 - The _____ contains hereditary material called chromosomes.
 - _____ are storage organelles for food, water, and wastes.
- C. Inside the _____, cellular respiration uses oxygen to convert food energy into a form the cell can use.
- _____ products of cellular respiration are carbon dioxide and water.
 - Leaf cells in plants contain **chloroplasts** that help the cell make its own food through _____.

Note-taking Worksheet (continued)**Section 2 The Different Jobs of Cells**

- A. The cells in many-celled organisms are _____ in shape and size for their function.
1. _____ specialized cells include fat cells, bone cells, nerve cells, and muscle cells.
 - a. _____ cells can store so much fat that the nucleus is pressed against the cell membrane.
 - b. A hard calcium and phosphorus material surrounds _____ cells.
 - c. _____ cells have many long branches to send and receive messages.
 - d. _____ cells have fibers that can contract and relax.
 2. _____ cells in leaves, stems, and roots are specialized to move food and water or to support the plant.
- B. Cells are _____ so they can work together to keep the organism alive.
1. **Tissues** are groups of similar cells that do the same kind of work; two or more tissues that work together form an _____.
 2. Groups of organs that work together to perform a job are called _____
_____.