

**Goal** • Use this summary to review the concepts in Unit 1, Cells and Systems.

Chapter 1 The cell is the basic unit of life.

- Living things have five main characteristics: they respond to their environment, they need energy, they grow, they reproduce, and they get rid of wastes. (1.1)
- A compound light microscope is an important tool in the study of microscopic living things. (1.1)
- Cell theory states that the cell is the basic unit of life. (1.2)
- Each cell structure and organelle carries out a specific task to help support the life functions of a cell. (1.2)
- Diffusion is the movement of particles from an area of higher concentration to an area of lower concentration. (1.3)
- Osmosis is the movement of water from an area of higher concentration to an area of lower concentration. (1.3)

Chapter 2 Human body systems work independently and together.

- The human body is organized into different organ systems. (2.1)
- Cells with the same structure and function form tissues, and groups of tissues form organs. (2.1)
- There are four stages in digestion: ingesting, digesting, absorbing, and eliminating. (2.2)
- The digestive system is like a long tube along which organs perform different functions during the digestion process. (2.2)
- In the excretory system, the process of excretion removes liquid wastes from the body. (2.2)
- The circulatory system consists of the heart and a network of blood vessels that carry blood throughout the body. (2.3)
- The respiratory system is made up of structures and organs that help move oxygen into the body and carbon dioxide out of the body. (2.3)

Chapter 3 The immune system protects the human body.

- Infectious diseases are caused by pathogens. (3.1)
- The immune system attacks and destroys invaders such as pathogens and antigens that enter the body. (3.1)
- The immune system's first line of defence is the skin and linings of the body's internal systems. (3.1)
- The immune system's second line of defence may be either an innate immune response or an acquired immune response to an invading pathogen. (3.1)
- Vaccines are weakened versions of a disease pathogen. (3.2)
- Immune system disorders occur when the immune system malfunctions and works against the body it is supposed to protect. (3.2)

Goal • Use this page to review the Unit 1 Key Terms.

### Chapter 1 Key Terms

- bacteria
- cell
- cell membrane
- cell theory
- cell wall
- chloroplast
- compound light microscope
- cytoplasm
- diffusion
- electron micrograph
- endoplasmic reticulum
- eukaryotic cells
- Golgi body
- lysosome
- metabolism
- mitochondria
- nucleus
- organelle
- organism
- osmosis
- prokaryotic cells
- ribosome
- scanning electron microscope
- selectively permeable membrane
- vacuole
- virus

### Chapter 2 Key Terms

- arteries
- capillaries
- circulatory system
- digestion
- digestive system
- excretion
- excretory system
- gas exchange
- gastric juice
- mucus
- nutrients
- organ
- organ system
- respiratory system
- tissue
- veins
- villi

### Chapter 3 Key Terms

- antibody
- antigen
- immune system
- pathogen
- white blood cells
- vaccine

Goal • Test your understanding of Unit 1, Cells and Systems.

### What to Do

Circle the letter of the best answer.

1. What are the structures inside of a living cell that have specific functions?
  - A. organs
  - B. systems
  - C. membranes
  - D. organelles
2. If you were comparing a cell to a home, what part of the home would best describe the mitochondria?
  - A. furnace room
  - B. garage
  - C. hallway
  - D. kitchen
3. Which of the following structures does a plant cell have that an animal cell does not?
  - A. cytoplasm
  - B. ribosome
  - C. chloroplast
  - D. endoplasmic reticulum
4. Which of the following best describes cellular respiration?
  - A. glucose + oxygen  $\rightarrow$  carbon dioxide + water + energy
  - B. glucose + oxygen + energy  $\rightarrow$  carbon dioxide + water
  - C. carbon dioxide + water  $\rightarrow$  glucose + oxygen + energy
  - D. glucose + carbon dioxide  $\rightarrow$  oxygen + water + energy
5. The Golgi body sorts proteins and packs them into membrane-wrapped structures called
  - A. ribosomes
  - B. vacuoles
  - C. vesicles
  - D. lysosomes
6. Which of the following descriptions of the cell wall is false?
  - A. tough, rigid structure found inside the cell membrane
  - B. protects the cell
  - C. provides support for a growing plant
  - D. helps give a plant cell its shape
7. Which of the following best describes photosynthesis?
  - A. carbon dioxide + oxygen + energy  $\rightarrow$  glucose + water
  - B. glucose + oxygen + energy  $\rightarrow$  carbon dioxide + water

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## Unit 1 Key Terms

- C. carbon dioxide + water + energy → glucose + oxygen  
 D. glucose + carbon dioxide → oxygen + water + energy
8. Which system is responsible for transporting oxygen and nutrients around the body?  
 A. respiratory system  
 B. endocrine system  
 C. nervous system  
 D. circulatory system
9. If your bronchi became blocked, which body system would be most directly affected?  
 A. circulatory system  
 B. nervous system  
 C. excretory system  
 D. respiratory system
10. Which of the following terms best represents a disease-causing organism?  
 A. pathogen  
 B. antigen  
 C. antibody  
 D. plaque

Match the Term on the left with the best Descriptor on the right.  
 Each Descriptor may be used only once.

Term	Descriptor
_____ 11.gastric juice	A. holds the three objective lenses
_____ 12.fine focus knob	B. brings an object into focus at high power
_____ 13.bile	C. supports the entire microscope
_____ 14.eyepiece	D. breaks down fat into small droplets
_____ 15.revolving nosepiece	E. brings an object into focus at low or medium power
_____ 16.stage	F. is used for viewing and contains a lens that magnifies
_____ 17.pepsin	G. digested intestinal contents
_____ 18.base	H. contains hydrochloric acid
_____ 19.chyme	I. supports the slide
_____ 20.coarse focus knob	J. breaks down protein
	K. important for clotting blood

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## Short Answer Questions

21. Human red blood cells placed into a strong salt solution rapidly shrivel, while those placed in pure water swell and explode. Explain why this occurs.

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22. (a) What is the difference between an organelle and an organ system?

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- (b) Give an example of each one.

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23. Mixed connective tissue disease is an affliction where a person's immune system attacks and destroys their own connective tissue.

- (a) What is the role of connective tissue in the body?

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- (b) What do you think the consequences would be if the connective tissue in the body were damaged by this disease?

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24. There are many "fad diets" that advise cutting certain things out of your diet. It is usually not a good idea to abandon a well-balanced diet. Suppose a "fad diet" cuts proteins completely out of the daily diet. Why would cutting protein out of your diet be dangerous?

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25. State three reasons why water is necessary for life.

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26. State two ways in which bacteria are beneficial to your digestive system.

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27. Calcium is a required nutrient for your body.

(a) What type of nutrient is calcium?

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(b) What are the consequences of not getting enough calcium in your diet?

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28. Why does the number of white blood cells in your blood increase when you have an infection?

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29. Around the year 1800, Edward Jenner deliberately infected a boy with cowpox in order to give him immunity to the more serious disease smallpox. How is what Jenner did similar to and different from today's modern vaccines?

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30. In rare cases, a baby is born with a defective immune system that is incapable of producing B cells. Explain exactly why the lack of B cells would cause an immune system to be defective.

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