

Understanding Main Ideas (Part A)

Write the word or phrase that best completes the statement.

1. Beneath the scab of a wound, skin cells begin to multiply to fill in the gap.
2. Red marrow produces red blood cells, some white blood cells, and cell fragments involved in blood clotting.
3. The mineral calcium, found in dairy products, is a critical part of the diet for healthy, strong bones.
4. Contraction of smooth muscle, the muscle of internal organs, is slow and prolonged.
5. Bones grow in length at the ends of the bone. They grow in diameter on the outer surface of the bone.
6. Muscle strength depends on the thickness of the fibers and the number of fibers that contract at one time.
7. When an inadequate supply of oxygen is available to meet a muscle cell's oxygen needs, lactic acid fermentation becomes the primary source of ATP.

Answer the following questions.

8. Why is the skin considered an organ? Name two important functions of skin.
The skin is an organ because it consists of tissues joined together to perform specific activities. Functions of the skin include regulation of body temperature, protection from physical and chemical damage, and sensing information from the environment.
9. Explain what causes a sprain and what the effects are.
Caused by forcible twisting of a joint, a sprain can result in injury to the bursae, ligaments, or tendons of the joint.

Chapter
34Protection, Support,
and Locomotion, *continued*

Chapter Assessment

Understanding Main Ideas (Part B)

In the space at the left, write the letter of the word, phrase, or sentence that best completes the statement or answers the question.

- ^B 1. The skin regulates the temperature of the body on a hot day by
- a. closing the pores.
 - b. dilating the capillaries.
 - c. constricting the blood.
 - d. reducing access to the exterior.
- ^C 2. After suffering widespread third-degree burns, the burn victim
- a. is unlikely to incur bacterial infection.
 - b. recovers in a short time.
 - c. has a harder time regulating body temperature.
 - d. has slight damage to cells of the dermis.
- ^D 3. Which of the following examples illustrates a pivot joint in use?
- a. You wind up to pitch a baseball.
 - b. You wave good-bye to a friend.
 - c. You kick a football.
 - d. You look behind you.
- ^C 4. By age 20, a person's bones stop growing because
- a. bone-forming cells are no longer present.
 - b. less calcium is present in the body.
 - c. hormones cause the growth centers at the ends of bones to degenerate.
 - d. bone cells receive less oxygen and nutrients at that time.

Answer the following questions.

5. How does the sliding filament theory explain muscle contraction?

The sliding filament theory states that actin filaments within a sarcomere slide toward one another during contraction. Myosin filaments do not move.

6. How does the buildup of lactic acid in muscle cells result in more oxygen being delivered to your cells?

Excess lactic acid in the bloodstream makes the blood more acidic. This stimulates rapid breathing, which supplies more oxygen to the muscle cells. The oxygen breaks down the lactic acid.

7. Explain one beneficial and one harmful effect of exposure to sunlight.

When exposed to the ultraviolet rays in sunlight, dermis cells produce vitamin D, a nutrient that aids calcium absorption. However, exposure to ultraviolet light can damage skin cells and accelerate the aging process.

Understanding Main Ideas (Part A)

In the space at the left, write the letter of the word or phrase that best completes the statement or answers the question.

- C 1. Starches are large
 a. fats. b. proteins. c. polysaccharides. d. monosaccharides.
- D 2. Which of the following is *not* mechanical digestion?
 a. chewing food b. breakdown of fats by bile
 c. churning of the stomach d. action of pepsin on proteins
- A 3. The surface area of the small intestine is greatly increased by
 a. a large number of villi. b. chemical digestion.
 c. peristalsis. d. mechanical digestion.
- B 4. Which of the following is part of the digestive tract?
 a. liver b. small intestine c. gallbladder d. pancreas
- B 5. Which of the following occurs in the large intestine as the work of anaerobic bacteria?
 a. absorption of water
 b. synthesis of vitamin K and some B vitamins
 c. change of glucose to glycogen
 d. elimination of indigestible matter
- B 6. Vitamins are used by the body to
 a. provide energy. b. maintain growth and metabolism.
 c. supply building materials. d. digest proteins.
- B 7. Which is the most abundant substance in the body?
 a. fat b. water c. sugar d. protein
- A 8. The body's preferred energy source is
 a. carbohydrates. b. vitamins. c. proteins. d. minerals.
- B 9. As a result of digestion, proteins are broken down into
 a. monosaccharides. b. amino acids.
 c. triglycerides. d. glycerol.
- D 10. Cellulose is important in the diet as a source of
 a. energy. b. protein. c. fat. d. fiber.
- D 11. Pepsin works best in the presence of
 a. amylase. b. protein.
 c. saliva. d. hydrochloric acid.

Understanding Main Ideas (Part B)

Answer the following questions.

1. Name and describe the type of feedback mechanism that controls most endocrine glands.

The majority of endocrine glands operate under a negative feedback system. A gland makes and secretes a specific hormone. The hormone travels to its target tissue and an appropriate response occurs. Then information about the hormone's level or its effect on the body is fed back to regulate the gland's production of that hormone.

2. How do glucagon and insulin affect blood glucose levels?

Glucagon increases blood glucose levels by binding to muscle and liver cells and signaling them to release glucose. Insulin signals liver and muscle cells to take in glucose, lowering blood glucose levels.

3. Describe how a steroid hormone affects its target cell.

Steroid hormones diffuse through the target cell's plasma membrane and bind to receptor sites inside the cell. The hormone-receptor complex then travels to the nucleus and activates the synthesis of specific mRNA molecules. These mRNA molecules then activate the synthesis of certain proteins.

4. Describe how an amino acid hormone affects its target cell.

Amino acid hormones bind to receptors embedded in the target tissue's plasma membrane. From outside the target cell, amino acid hormones activate enzyme pathways within the cell.

5. Describe the relationship among the hypothalamus, the pituitary gland, and the endocrine glands that are under the control of the pituitary gland.

The hypothalamus sends signals to the pituitary gland. The pituitary gland then releases hormones or stimulates other glands to release hormones.

6. Explain why the pituitary gland is considered the master gland of the endocrine system.

The pituitary gland controls most of the other endocrine glands, including the thyroid gland, the adrenal glands, and glands that control reproduction.

Understanding Main Ideas (Part A)

In the space at the left, write the letter of the word or phrase that best completes the statement or answers the question.

- B** 1. Sensory neurons
- a. process incoming impulses and pass them on to motor neurons.
 - b. carry impulses from around the body to the brain and spinal cord.
 - c. carry response impulses away from the brain and spinal cord.
 - d. carry impulses across synapses.
- C** 2. A nerve impulse travels from one cell to another by passing from
- a. one axon to another axon.
 - b. one dendrite to an axon.
 - c. one axon to a dendrite.
 - d. one dendrite to another dendrite.
- C** 3. Which controls involuntary activities of the body such as breathing and heart rate?
- a. cerebrum b. cerebellum c. medulla oblongata d. none of these
- C** 4. You can see the colors in a picture because you are aided by the
- a. rods of the retina.
 - b. right visual field.
 - c. cones of the retina.
 - d. left visual field.
- B** 5. A person who is addicted to a drug is experiencing withdrawal when he or she
- a. needs more of the drug to achieve the same effect.
 - b. becomes ill after stopping its use.
 - c. needs to take the drug more often.
 - d. feels better when stopping its use.
- D** 6. Cocaine is a stimulant because it
- a. causes blood pressure to drop.
 - b. causes heart rate to slow down.
 - c. relieves anxiety.
 - d. causes vasoconstriction.
- B** 7. Alcohol may act on the brain by
- a. dissolving through the membranes of neurons.
 - b. blocking the movement of sodium and calcium ions.
 - c. increasing anxiety.
 - d. increasing oxygen content.

Understanding Main Ideas (Part B)

Answer the following questions.

1. How is a nerve impulse transmitted through a neuron?

When a stimulus excites a neuron, sodium channels in the membrane open up, allowing sodium ions to rush inside. The inside of the neuron becomes more positively charged than the outside, a condition that sets up a wave of changing charges down the length of the axon as the nerve impulse moves along it.

2. How does a nerve impulse pass from neuron to neuron?

As an impulse reaches the end of an axon, the changing charges open calcium channels, allowing calcium to enter the end of the axon. The calcium causes neurotransmitters to be released. They then diffuse across the synaptic space to the dendrite of the next neuron.

3. How is the eye adapted for vision in a dimly lit place?

The eye has special light receptors called rods, which are adapted for vision in dim light. The rods help the viewer to detect the shape and movement of objects in near darkness.

4. How do the semicircular canals help you to keep your balance?

The semicircular canals are filled with thick fluid and lined with hair cells. The mechanical movements of the hairs stimulate the neurons to carry an impulse to the brain. Motor neurons in the brain then stimulate muscles in the head and neck to readjust the position of your head so you maintain your balance.

5. What is the role of the somatic nervous system in your body?

Sensory nerves of the somatic nervous system relay information mainly from your skin to the CNS, which relays a response through motor neurons of the somatic system to the skeletal muscles. Reflexes, which are automatic, also occur through the somatic system.

Chapter
37Respiration, Circulation,
and Excretion, *continued*

Chapter Assessment

Understanding Main Ideas (Part A)

In the space at the left, write true if the statement is true. If the statement is false, change the italicized word or phrase to make it true.

- FALSE 1. Red blood cells are produced in the ~~spleen~~. ^{RED MARROW}
- FALSE 2. The blood in the veins is prevented from flowing backward because of ~~pressure~~ in these blood vessels. ^{VALVES}
- FALSE 3. The only veins that carry oxygen-rich blood are the ~~venae cavae~~. ^{PULMONARY VEINS}
- FALSE 4. When blood first enters the heart, it passes into the ~~ventricles~~. ^{ATRIA}
- TRUE 5. As the liquid passes through the *U-shaped tubule* in the nephron, most of the ions and water and all of the glucose and amino acids are reabsorbed into the bloodstream.
- FALSE 6. The major waste products of the cells are ammonia and the wastes from the breakdown of ~~carbohydrates~~. ^{PROTEINS}
- FALSE 7. The urine of a person who has diabetes may contain excess *salts*.
- FALSE 8. Carbon dioxide and ~~oxygen~~ ^{WATER} are the waste products of cellular respiration.
- TRUE 9. When your diaphragm *contracts*, the space in the chest cavity becomes larger.
- TRUE 10. Breathing is controlled by changes in the chemistry of the blood, which cause the *medulla oblongata* to react.
- FALSE 11. Your pulse represents the pressure that blood exerts as it pushes the walls of a(n) ~~vein~~. ^{ARTERY}
- FALSE 12. If you have type A blood and ~~anti-A~~ ^{anti-B} is added during a transfusion, no clumps will form.
- FALSE 13. ~~External respiration~~ ^{cellular respiration} uses oxygen in the breakdown of glucose in cells in order to provide energy in the form of ATP.

Understanding Main Ideas (Part B)

Answer the following questions.

1. How does the respiratory system prevent most of the foreign matter in urban air from reaching your lungs?

The nasal cavity, trachea, and bronchi are lined with cilia that constantly beat upward toward your throat so that foreign particles can be expelled or swallowed. Also, cells in the trachea and the bronchi secrete mucus that can trap the particles.

2. Distinguish between systolic pressure and diastolic pressure.

When the ventricles contract, blood pressure rises sharply. This high pressure is called systolic pressure. As the ventricles relax, blood pressure drops; the lowest pressure occurs just before the ventricles contract again and is called diastolic pressure.

3. What problem may arise when a woman with Rh⁻ blood is pregnant with an Rh⁺ fetus?

Toward the end of pregnancy or at delivery, the fetal blood may leak through the placenta and mix with the mother's blood. If the mother is Rh⁻, she will produce antibodies against the Rh antigen. If she becomes pregnant again, the antibodies will cross the placenta and attack the red blood cells of an Rh⁺ fetus. If the fetus is Rh⁻, there is no problem.

4. How does a pacemaker set the heart rate?

The pacemaker generates an electrical impulse that spreads over both atria, signaling the two atria to contract at almost the same time. It also triggers cells at the base of the right atrium to send an electrical impulse over the ventricles, causing them to contract.

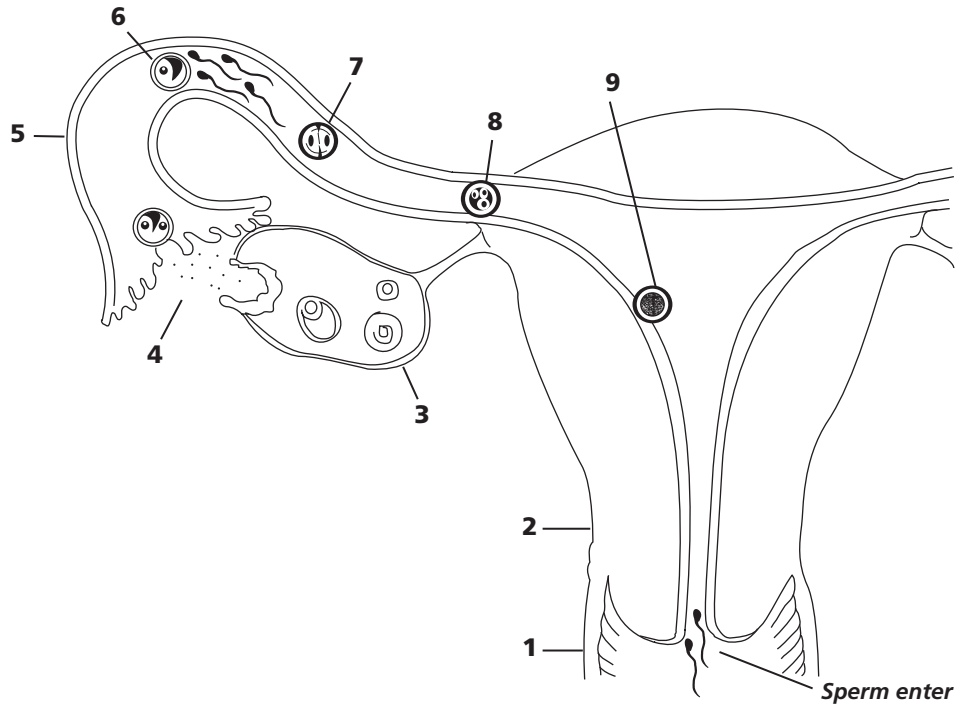
5. How does the urinary system maintain homeostasis?

The urinary system removes nitrogenous wastes, controls the level of sodium in blood, and regulates blood pH by filtering hydrogen ions out of the blood and allowing bicarbonate to be reabsorbed.

Understanding Main Ideas (Part A)

Label the diagram. Use these choices: ovary, implantation, blastocyst, ovulation, fertilization, uterus, zygote, vagina, oviduct.

1. vagina
2. uterus
3. ovary
4. ovulation
5. oviduct
6. fertilization
7. zygote
8. blastocyst
9. implantation



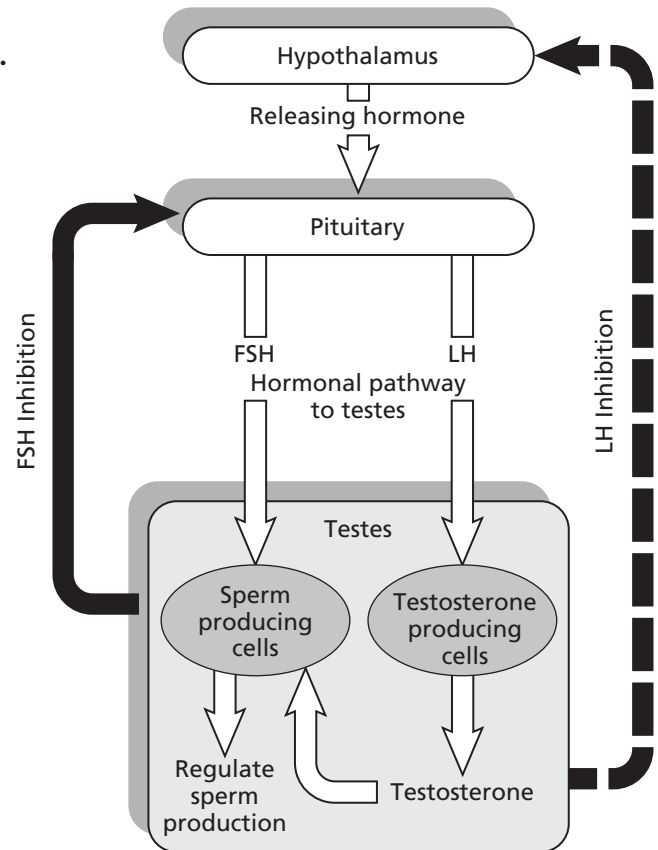
In the space at the left, write the letter of the word or phrase that best completes the statement.

- B 10. The fluid that provides energy for the sperm cells comes from the
 a. bulbourethral glands. b. seminal vesicles.
 c. prostate gland. d. urethra.
- C 11. When FSH reaches the testes, it causes the production of
 a. testosterone. b. LH.
 c. sperm cells. d. secondary sex characteristics.
- D 12. In the female, FSH stimulates the
 a. production of eggs. b. production of progesterone.
 c. blastocyst. d. development of a follicle in the ovary.
- C 13. All the body systems of the fetus are present by the
 a. third week. b. sixth week. c. eighth week. d. first month.

**Chapter
38**
**Reproduction and
Development, *continued***
Chapter Assessment
Understanding Main Ideas (Part B)

Use the diagram of the negative feedback system in the male to complete the following statements.

- The release of LH by the pituitary is stimulated by a hormone secreted by the hypothalamus.
- LH stimulates the production of testosterone.
- FSH and testosterone affect sperm production.
- An increase of testosterone inhibits LH production.
- Cells that produce sperm send signals to the pituitary and hypothalamus to stop releasing FSH.



Answer the following questions.

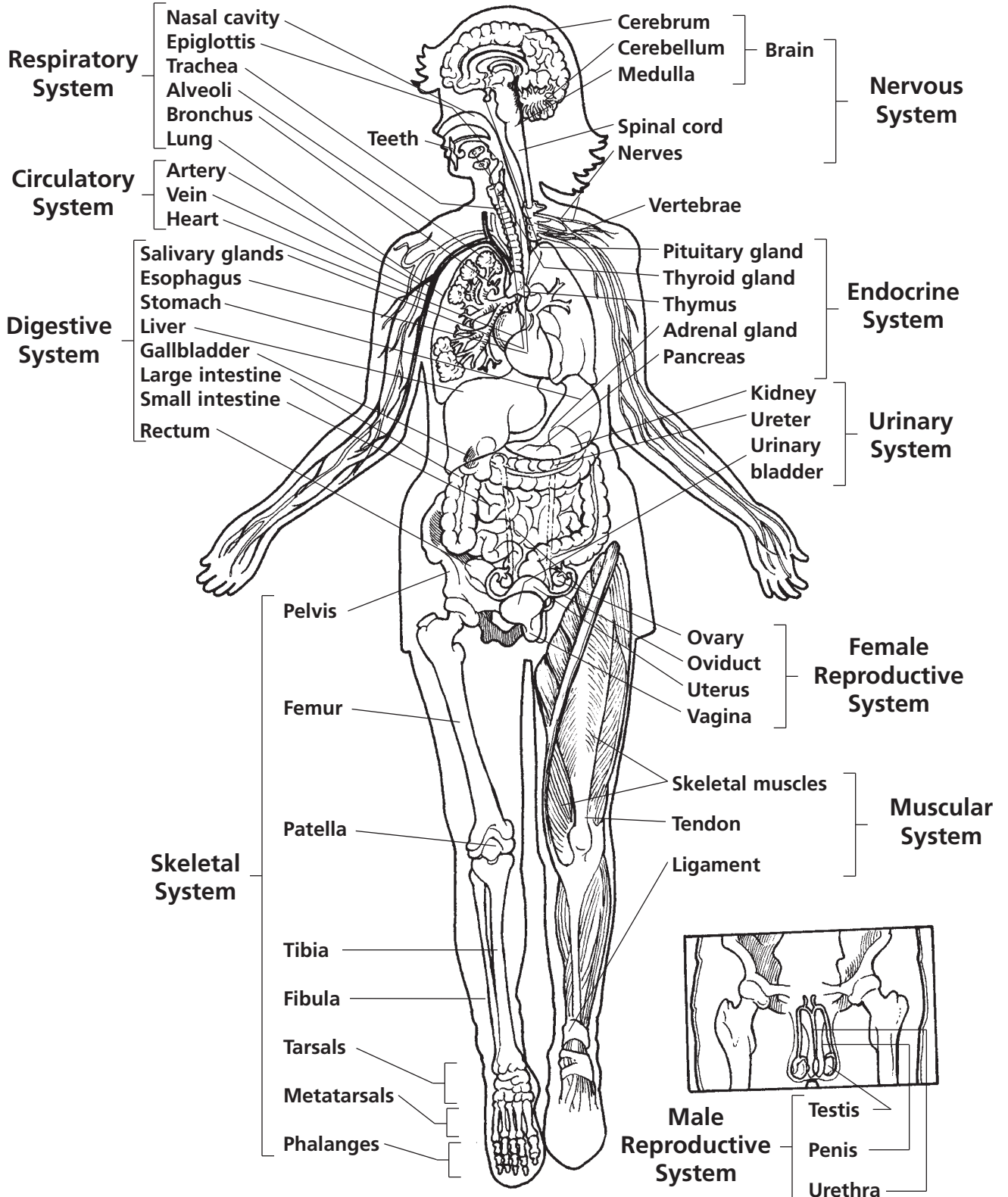
- Why is the scrotum located outside the male body?
Sperm can develop only at a temperature that is about 3°C lower than normal body temperature.
- What happens to the lining of the uterus if fertilization does not occur?
The lining is shed.
- What is the function of the corpus luteum?
It produces both progesterone and estrogen. The progesterone causes the uterine lining to thicken, to increase its blood supply, and to accumulate fat and tissue fluid in preparation for the arrival of a fertilized egg.

**Master
57**

Human Body Systems

Reteaching Skills

Use with *BioDigest 10, The Human Body*



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Worksheet
57**Human Body Systems****Reteaching Skills***Use with BioDigest 10, The Human Body*

1. Which system provides support for the body?

The skeletal system

2. Which system is made up of lungs and air passageways?

The respiratory system

3. Which three systems interact to provide mobility for the body?

The muscular, nervous, and skeletal interact to provide support.

4. In the female reproductive system, what is analogous to the testes in the male? Explain your response.

The ovaries in females are analogous to the testes in males because both produce gametes—sperm in males and eggs in females.

5. How does the urinary system help to maintain homeostasis?

The urinary system keeps a homeostatic balance of water, salts, and other compounds in the body. In addition, the urinary system assures that levels of wastes do not accumulate.

6. Describe the function of the circulatory system.

In the circulatory system, the heart acts as a muscular pump. Arteries, veins, and capillaries transport circulatory fluids throughout the body. The blood contains components for body defense, gas exchange, and nutrients for cells.

7. Which system prepares food for cellular utilization?

the digestive system

8. Which system secretes hormones needed to control the metabolism of body tissues?

the endocrine system

Understanding Main Ideas (Part B)

Answer the following questions.

1. How do researchers identify the specific cause of an infectious disease?

(1) They try to find a pathogen in the host in every case of the disease.
(2) They isolate the pathogen from the host and grow it in a pure culture.
(3) When they place a pathogen from the pure culture into a healthy host, it causes the disease. (4) The pathogen must then be isolated from the new host to prove it is the original pathogen.

2. How do interferons provide a defense against viruses?

Interferons are host-cell specific proteins produced by an infected body cell. The interferon diffuses into uninfected neighboring cells, which then produce antiviral proteins that can prevent the virus from multiplying.

3. How does a nonspecific defense mechanism differ from a specific defense mechanism?

A nonspecific defense mechanism is effective against a wide variety of pathogens. A specific defense mechanism achieves its goal by building up resistance against a specific pathogen or antigen.

4. What role do B cells play in immunity?

A B cell is activated by a T cell to produce antibodies, which are released into the bloodstream. The antibodies bind to antigens to which they can fit. This binding results in an antigen-antibody complex.

5. How does cellular immunity protect the body?

Cytotoxic, or killer, T-cells produce clones that then travel to the infected site and release enzymes directly into the pathogens, causing them to lyse and die.

6. Why is AIDS considered a disease of the immune system?

HIV, which causes AIDS, kills helper T cells that are important in developing the immune response.