CHAPTER 19

DIRECTED READING WORKSHEET

Body Organization and Structure

As you read Chapter 19, which begins on page 462 of your textbook, answer the following questions.

This Really Happened . . . (p. 462)

1. The people who were wearing life jackets didn’t drown after the Titanic struck an iceberg. Why did they die?

They died because the cold water lowered their body temperature so that their body systems couldn’t function.

2. In this chapter, you’ll learn how our bodies maintain a constant internal temperature.

What Do You Think? (p. 463)

Answer these questions in your ScienceLog now. Then later, you’ll have a chance to revise your answers based on what you’ve learned.

Investigate! (p. 463)

3. You experience pain when someone steps on your toe. What is your body trying to tell you?

Your body is trying to tell you to move your toe to safety.

Section 1: Body Organization (p. 464)

4. How did Jack Thayer survive in the icy water during the Titanic disaster?

His body’s internal conditions did not change enough to stop his cells from working properly.

5. Homeostasis is the maintenance of a stable internal environment.

6. Cells can die if homeostasis is disrupted. (True) or False? (Circle one.)
**Four Types of Tissue** (p. 464)

7. How is your body like a soccer team?

   My body is like a soccer team because every cell has a specific job in maintaining homeostasis, just like every member of a soccer team has a special role in the game.

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Look at Figure 1 on pages 464–465. Then match each tissue type in Column B with its correct function in Column A, and write the corresponding letter in the space provided.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>d 8.</td>
<td>a. nervous tissue</td>
</tr>
<tr>
<td>c 9.</td>
<td>b. muscle tissue</td>
</tr>
<tr>
<td>a 10.</td>
<td>c. epithelial tissue</td>
</tr>
<tr>
<td>b 11.</td>
<td>d. connective tissue</td>
</tr>
<tr>
<td>d 8.</td>
<td>joins, supports, and insulates organs</td>
</tr>
<tr>
<td>c 9.</td>
<td>covers and protects underlying tissue</td>
</tr>
<tr>
<td>a 10.</td>
<td>sends electrical signals through the body</td>
</tr>
<tr>
<td>b 11.</td>
<td>produces movement</td>
</tr>
</tbody>
</table>

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**Tissues Form Organs** (p. 465)

12. Several types of tissue working together can do jobs that one type of tissue could not do by itself. True or False? (Circle one.)

Use Figure 2 to answer questions 13–15.

13. How does your brain know when your stomach is full?

   My brain knows when my stomach is full because nervous tissue in my stomach sends a signal to my brain.

14. Muscle tissue helps your stomach digest food by

   a. protecting the stomach during digestion.
   b. supplying the stomach with oxygen.
   c. crushing and grinding stomach contents.
   d. producing the acids that are used during digestion.

15. The stomach is supplied with **oxygen** by the blood.

16. The inside of your stomach is lined with **epithelial** tissue.
Organs Form Systems (p. 465)

17. Your stomach does all the work of digesting your food.
   True or False? (Circle one.)

Use the diagrams of human organ systems on pages 466–467 to answer the following questions. Each of the following statements is false. Change the underlined word to make the statement true. Write the new word in the space provided.

18. The digestive system provides a frame to protect and support body parts.
   skeletal

19. Your cardiovascular system consists of your heart and blood vessels, which break down blood throughout your body.
   pump

20. The nervous system releases chemical messengers from certain glands that regulate body functions.
   endocrine

21. In your respiratory system, your lungs absorb nutrients and release carbon dioxide.
   oxygen

22. Your integumentary system returns leaked fluids to your blood vessels and helps you get rid of harmful germs.
   lymphatic

23. Your skeletal system allows you to move your bones.
   muscular

24. The male reproductive system produces and delivers eggs.
   sperm

25. The urinary system removes wastes from the blood and regulates the body’s temperature.
   fluids

Review (p. 467)

Now that you’ve finished Section 1, review what you learned by answering the Review questions in your ScienceLog.
Section 2: The Skeletal System (p. 468)

1. Your skeleton is alive. True or False? (Circle one.)

The Burden of Being a Bone (p. 468)

2. Look at Figure 3. Which of the following statements are true about human bones? (Circle all that apply.)
   a. Some bones contain a material that makes white blood cells.
   b. Arm bones have hollow cavities that store fat.
   c. Bones protect your brain, heart, lungs, and spinal cord.
   d. Without bones, you could still sit.
   e. Adult humans have 260 bones.
   f. Bones store minerals.

What’s in a Bone? (p. 469)

3. Bones contain two different kinds of bone tissue. True or False? (Circle one.)

Determine whether each of the following statements is true of compact bone or spongy bone. In the space provided, write a C if it is true of compact bone and an S if it is true of spongy bone.

4. S
   It has many open spaces.

5. S
   It is where red blood cells are made.

6. C
   It contains small blood vessels.

7. C
   It contains tiny canals.

8. S
   It contains marrow.

9. C
   It provides most of the strength for the bone.

Growing Bones (p. 470)

10. Most of your skeleton was soft and rubbery when you were born. True or False? (Circle one.)

11. How do bones continue to grow during childhood?
   Growth plates made of cartilage remain in most bones, allowing bones to grow.

12. In Figure 5, the cartilage does not show up on the X ray because cartilage does not have the mineral density of bone.
What’s the Point of a Joint? (p. 470)
Use the text and Figure 6 to match the term in Column B with the correct phrase in Column A, and write the corresponding letter in the space provided.

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>c  13. immovable joint found in the skull</td>
<td>a. sliding joint</td>
</tr>
<tr>
<td>f  14. allows motion in all directions</td>
<td>b. ligament</td>
</tr>
<tr>
<td>e  15. allows you to only flex and extend</td>
<td>c. fixed joint</td>
</tr>
<tr>
<td>g  16. cushion found where two bones meet</td>
<td>d. joint</td>
</tr>
<tr>
<td>d  17. the place where two or more bones connect</td>
<td>e. hinge joint</td>
</tr>
<tr>
<td>b  18. elastic bands of tissue that hold joints together</td>
<td>f. ball-and-socket joint</td>
</tr>
<tr>
<td>a  19. allows bones to glide over one another</td>
<td>g. cartilage</td>
</tr>
</tbody>
</table>

Can Levers Lessen Your Load? (p. 471)
20. Your limbs are examples of simple machines. True or False? (Circle one.)
21. The measure of how many times a simple machine multiplies an ________ effort ________ applied to a ________ load ________ is known as the mechanical advantage.
22. Which of the pictures in Figure 7 shows a lever that cannot increase force?
   The arm bending is an example of a third class lever. Third class levers cannot increase force.

Review (p. 471)
Now that you’ve finished Section 2, review what you learned by answering the Review questions in your ScienceLog.

Section 3: The Muscular System (p. 472)
1. Why can’t you stay perfectly still no matter how hard you try?
   I can’t stay perfectly still because some of my muscles are always working.
2. The muscular system is made up of ___________ and ___________.

Types of Muscle (p. 472)
Mark each of the following statements True or False.

3. True False Cardiac muscle is found only in the heart.
4. False True When smooth muscle moves blood through your blood vessels, the action is voluntary.
5. False True The actions of skeletal muscles are always voluntary.
6. True False Cardiac-muscle action is always involuntary.
7. True False Skeletal muscles help protect your inner organs.
8. False True There are three types of muscle: cardiac, voluntary and skeletal.

Making Your Move (p. 473)

9. To make a funny face, what has to happen in your body?

To make a funny face, electrical signals have to travel from my brain to the skeletal muscle cells, and those cells have to respond by getting shorter.

10. Look at Figure 9. It takes more muscles to smile than to frown. True or False? (Circle one.)

11. Tendons are strands of connective tissue that connect ___________ skeletal muscles ________ to ___________ bones _________.

12. Most skeletal muscles
   a. work independently.
   b. are connected to each other by bones.
   c. are strands of tough connective tissue.
   d. work in pairs.

13. When your arm is extended, the triceps muscle
   a. is bending. b. acts involuntarily. c. is the flexor. d. is the extensor.
Use It or Lose It (p. 474)

14. How does having strong muscles benefit the rest of the body?

Having strong muscles benefits the rest of the body because when the muscles contract, the blood vessels in the muscles get squeezed. This action increases blood flow without making the heart work harder.

15. A resistance exercise requires the _______ muscles to overcome the weight of another object.

16. Aerobic exercises, such as swimming, are best for strengthening your _______ heart and for increasing the _______ endurance of your _______ skeletal muscles.

Muscle Injury (p. 475)

17. List two things that can cause a muscle to overstretch or tear.

Answers should include two of the following: improper muscle conditioning, an exercise being done improperly, and inadequately warming up a muscle.

18. When tendons are overused, they can become _______ inflamed _______. (immobile or inflamed)

19. Which of the following characteristics of anabolic steroids is NOT true?

a. They resemble a male sex hormone.
b. They threaten the heart.
c. They cause immature bones to stop growing.
d. They make muscles bigger and stronger.
e. They make you lose weight.

Review (p. 475)

Now that you've finished Section 3, review what you learned by answering the Review questions in your ScienceLog.
Section 4: The Integumentary System (p. 476)
1. What organ comes in a variety of colors, is partly dead, and protects people from the outside world?
   The skin comes in a variety of colors, is partly dead, and protects people from the outside world.

2. The integumentary system is made up of
   skin, hair, and nails.

The Skin: More than Just a “Coat” (p. 476)
3. Which of the following are true of skin?
   (Circle all that apply.)
   a. It contains nerve endings.
   b. It uses sweat to keep you warm.
   c. It keeps moisture inside the body.
   d. It releases sweat that removes wastes from the bloodstream.

4. Darker skin has more melanin than lighter skin. True or False? (Circle one.)

5. How does the melanin in your skin help prevent cancer?
   The melanin in my skin helps prevent cancer by absorbing much of the harmful radiation from the sun that can cause DNA damage that can lead to cancer.

A Tale of Two Layers (p. 477)
Mark each of the following statements True or False.

6. False  The epidermis is thicker than the dermis.

7. False  Epidermal cells have no known function because they are dead.

8. True  The dermis is strong yet flexible.

9. True  Skin is a complex organ that contains many smaller structures.
10. Look at Figure 16. The oil glands in your skin
   a. make oil that causes the hair to stand up straight.
   b. make oil that helps keep the epidermis waterproof.
   c. help the sweat glands make extra sweat.
   d. make oil that keeps the hair hard and brittle.

**Hair and Nails** (p. 478)
11. All the living cells in your hair are in the hair
    ________________.

12. Hairs do not block ultraviolet light. True or False? (Circle one.)
13. Hair and skin use different pigments for color. True or False? (Circle one.)

14. What causes a goose bump to form?
    A goose bump forms when the tiny muscle attached to the hair follicle
    contracts. When the muscle contracts, the hair follicle bends, pushing up
    the epidermis to form a goose bump.

15. A furry animal might get goose bumps on a cold day because
    a. the muscles attached to the hair follicles contract.
    b. the lifted hairs block the wind.
    c. the animal looks bigger.
    d. making “goose bumps” uses a lot of energy and takes extra heat.

16. Your nails decrease the sensitivity of your fingertips.
    True or False? (Circle one.)

**Living in Harm’s Way** (p. 479)
17. Look at Figure 19. How does your skin heal itself when you get a
    cut?
    When I get a cut, a blood clot forms that keeps bacteria from entering the
    wound. Bacteria-fighting cells come to kill the bacteria, and the damaged
    cells are replaced through cell division.
18. Look at Figure 20. What is the difference between an ordinary mole and a mole that may become cancerous?
   a. Cancerous moles are darker than ordinary moles.
   b. Cancerous moles are more symmetrical than ordinary moles.
   c. Cancerous moles are smaller than ordinary moles.
   d. Cancerous moles are more asymmetrical than ordinary moles.

Answer the following questions after you finish reading page 479. Match each term in Column B with the correct phrase in Column A, and write the corresponding letter in the space provided.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>e 19. caused by hair follicles clogged with oil, dead skin cells, and bacteria</td>
<td>a. skin</td>
</tr>
<tr>
<td>f 20. a mass of skin cells caused by uncontrolled cell division</td>
<td>b. mole</td>
</tr>
<tr>
<td>b 21. darkened area of the skin</td>
<td>c. cancer</td>
</tr>
<tr>
<td>a 22. the most exposed part of the body</td>
<td>d. sex hormones</td>
</tr>
<tr>
<td>c 23. a tumor that invades other tissues</td>
<td>e. infections</td>
</tr>
<tr>
<td>d 24. chemicals that cause oil glands to produce too much oil</td>
<td>f. tumor</td>
</tr>
</tbody>
</table>

**Review** (p. 479)

Now that you’ve finished Section 4, review what you learned by answering the Review questions in your Science Log.