

Assess Your Understanding

Body Organization

How Is Your Body Organized?

1a. **REVIEW** How are cells, tissues, and organs related?

b. **INFER** What systems of the body are involved in preparing and eating a sandwich?

c. **MAKE JUDGMENTS** How does learning about body systems help you make informed decisions about your health?

got it?

- I get it! Now I know that the body's levels of organization, from least complex to most complex, are _____

- I need extra help with _____

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Key Concept Summary

Body Organization

How Is Your Body Organized?

Every minute of the day, no matter what a person is doing, the body is busy at work. Each part of the body has a specific job to do. All the parts work together to keep the body functioning smoothly and effectively. The organization of the body is in part responsible for this smooth functioning.

The levels of organization in the human body consist of cells, tissues, organs, and organ systems. A **cell** is the basic unit of structure and function in a living thing, or organism. Almost all cells in the human body have the same basic parts. The **cell membrane** forms the outside border of a cell. The **nucleus** directs the cell's activities and holds information that controls a cell's function. The **cytoplasm**, which forms the rest of the cell, is a clear, jellylike substance that contains many cell structures, each of which has a specific job to perform.

A group of similar cells that perform the same function is called a **tissue**. Muscle tissue is made

up of muscle cells. **Muscle tissue** contracts and thus makes body parts move. **Nervous tissue**, made up of nerve cells, carries electrical messages to and from the brain and spinal cord, thereby directing and controlling body processes. **Connective tissue** provides support for the body and connects all its parts. Connective tissue can be made up of bone cells and fat cells. **Epithelial tissue** covers both the internal (inside) and external (outside) surfaces of the body.

A group of different types of tissue performing a specific function is called an **organ**. Each type of tissue in an organ does its specific job and in that way contributes to the organ's function. Each organ is part of an **organ system**, or a group of organs that work together to perform a major function. Organ systems also work together, forming the next level of organization, the organism.

On a separate sheet of paper, create a diagram that shows the levels of organization in the human body from the least complex to the most complex. For each labeled level, provide an example.

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Lesson Quiz

Body Organization

Write the letter of the correct answer on the line at the left.

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. ___ The control center of a cell is the</p> <p>A cytoplasm</p> <p>B cell membrane</p> <p>C nucleus</p> <p>D chromosome</p> | <p>2. ___ Skin, ears, and kidneys are examples of</p> <p>A organs</p> <p>B tissues</p> <p>C organ systems</p> <p>D cells</p> |
| <p>3. ___ Which of the following is not true about connective tissue?</p> <p>A It provides support for the body.</p> <p>B It connects all of the body's parts.</p> <p>C Bone tissue and fat tissue are examples of connective tissue.</p> <p>D It makes parts of the body move.</p> | <p>4. ___ A tissue that has the ability to contract is</p> <p>A nerve tissue</p> <p>B epithelial tissue</p> <p>C muscle tissue</p> <p>D connective tissue</p> |

If the statement is true, write *true*. If the statement is false, change the underlined word or words to make the statement true.

5. _____ The skin is made up of nervous tissue.
6. _____ The endocrine system removes waste products from the body.
7. _____ The least complex level of organization of the human body is a(n) cell.
8. _____ A group of similar cells performing the same function is a(n) organ.
9. _____ Each organ in the body is part of a(n) organ system performing a major function.
10. _____ As one moves from tissues to organs, the levels become less complex.

Assess Your Understanding

System Interactions

How Do You Move?

got it?

I get it! Now I know that _____ and _____ work together to make the body move.

I need extra help with _____

Which Systems Move Materials Within Your Body?

1a. LIST Name four body systems that are involved in getting oxygen to your cells.

b. EXPLAIN How is absorption an important function of the digestive system?

c. DRAW CONCLUSIONS How does the circulatory system help other systems function?

got it?

I get it! Now I know that materials are moved within my body by the _____

I need extra help with _____

Assess Your Understanding

System Interactions

Which Systems Control Body Functions?

2a. **COMPARE AND CONTRAST** How are the nervous system and the endocrine system different?

b. **APPLY CONCEPTS** Describe an example of a stimulus and response that involves your sense of hearing.

got it?.....

- I get it! Now I know that the _____ system and _____ system work together to _____.
- I need extra help with _____

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Key Concept Summaries

System Interactions

How Do You Move?

The skeletal system, or **skeleton**, includes all the bones in the body. The muscular system is made up of all the muscles in the body. **Muscles and bones work together to make your body move. The nervous system tells your muscles when to act.** The muscles that are attached to the bones of the skeleton are **skeletal muscles**. They provide the

force that moves the bones. Muscles can contract and relax. When a muscle contracts, it pulls on the bones to which it is attached. A **joint** is a place where two or more bones meet. Movement occurs at joints by the action of muscles on bones. The nervous system controls when and how the muscles act on bones.

Which Systems Move Materials Within Your Body?

The respiratory, digestive, circulatory and excretory systems play key roles in moving materials within your body. The circulatory system—heart, blood vessels, and blood—brings essential materials to all cells of the body and carries away cell wastes. One of those essential materials is oxygen, and one of the wastes is carbon dioxide.

The circulatory system delivers oxygen to all body cells and carries back carbon dioxide to the lungs, where it is eliminated when air is exhaled. Oxygen is needed by the cells to release energy from sugar molecules.

The respiratory system moves oxygen into the body and carbon dioxide out of the body. Air that is inhaled goes into the lungs, an organ of the respiratory system, where oxygen from the air moves into the bloodstream.

The digestive system breaks down foods into **nutrients**, substances that the body needs to carry out its functions, which then move into the bloodstream through **absorption**. The circulatory system delivers the nutrients to all body cells.

Which Systems Control Body Functions?

The nervous system and the endocrine system work together to control body functions. Information gathered by the senses in the form of a **stimulus** travels through nerves to the brain or spinal cord and produces a **response**, often involving

other body systems. **Glands** of the endocrine system produce **hormones**, chemicals released directly into the bloodstream and transported throughout the body. Hormones affect many body processes.

On a separate sheet of paper, draw eight large circles. Fill in each circle with the name and function of one of the systems you have studied in this lesson. Then connect various systems with arrows and along the arrows explain how the systems work together.

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Lesson Quiz

System Interactions

Write the letter of the correct answer on the line at the left.

1. ____ The two systems that control body functions are the
A digestive and circulatory systems
B excretory and nervous systems
C nervous and endocrine systems
D endocrine and respiratory systems
2. ____ Which of the following is not a stimulus?
A hearing a loud noise
B sneezing
C touching a hot object
D tasting a lemon
3. ____ The gas cells need in order to release energy from sugar molecules is
A carbon dioxide
B water vapor
C nitrogen
D oxygen
4. ____ The muscles attached to bones that provide the force to move the bones are
A striated muscles
B skeletal muscles
C smooth muscles
D connective muscles

Fill in the blank to complete each statement.

5. The circulatory system works with the _____ system to get nutrients to all body cells.
6. Chemical substances produced by glands that affect many body processes are called _____.
7. _____ is the process by which nutrients move from the digestive system into the bloodstream.
8. Chemical substances needed by body cells that result from the process of digestion are called _____.
9. Another name for the circulatory system is the _____ system.
10. The elbow and shoulder are examples of _____.

Assess Your Understanding


Homeostasis

How Does Your Body Stay in Balance?

1a. DEFINE What is homeostasis?

b. LIST Give four examples of conditions in your body that are related to maintaining homeostasis.

c. RELATE CAUSE AND EFFECT Give an example of how stress can affect homeostasis.

d. ANSWER  How does your body work? Use what you have learned about how your body systems function to write your answer.

got it?

I get it! Now I know that maintaining homeostasis depends on _____

I need extra help with _____

Key Concept Summary

Homeostasis

How Does Your Body Stay in Balance?

<p>Although conditions outside the human body may change, conditions inside the body stay stable. Such conditions include chemical makeup of the cells, their water content, and body temperature. The condition in which an organism's internal environment is kept stable in spite of changes in the outside environment is called homeostasis. Homeostasis is necessary for an organism's proper functioning and survival.</p>	<p>response. Homeostasis is never the responsibility of only one system; it relies on the interaction of many body systems. Maintaining body balance in terms of position involves structures in the inner ear that sense the position of the head and send messages to the brain.</p>
<p>All of your body systems working together maintain homeostasis and keep the body in balance. Body responses that maintain homeostasis in the face of changes in external conditions include shivering, sweating, being hungry, and being thirsty. In each of these cases, the nervous and endocrine systems respond to a change in the body's internal environment and control the responses. They also signal other body systems to play a role in the</p>	<p>Stress is the reaction of the body to possibly threatening, challenging, or uncomfortable events. Some stress is normal and healthy, and once the stress is over, the body returns to a healthier condition. However, too much negative stress can be unhealthy. Homeostasis can be disrupted by ongoing stress. Thus managing stress is important to having a healthy lifestyle. When homeostasis is maintained, a person is healthy. Bacteria and viruses can upset homeostasis and make a person sick. The body's immune system helps fight disease.</p>

On a separate sheet of paper, define the terms *homeostasis* and *stress* and explain how they are related. Include an example in your explanation.

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Lesson Quiz

Homeostasis

Write the letter of the correct answer on the line at the left.

1. ____ The condition in which the body's internal environment is kept stable is called
A homeopathy
B homeostasis
C metabolism
D equilibrium
2. ____ Which of the following is **NOT** a good way to manage stress?
A Get enough sleep.
B Eat a healthful diet.
C Spend most of the time alone.
D Get plenty of exercise.
3. ____ What is the body's response to the stimulus of getting overheated?
A sweating and thirst
B shivering and hunger
C sweating and shivering
D shivering and thirst
4. ____ Which of the following statements about homeostasis is **NOT** true?
A Maintaining homeostasis requires that all of the body systems work together.
B Long periods of stress can disrupt homeostasis.
C Body temperature is a factor of homeostasis.
D Only the nervous and endocrine systems are involved in maintaining homeostasis.

If the statement is true, write *true*. If the statement is false, change the underlined word or words to make the statement true.

5. _____ The nose helps the body keep its balance.
6. _____ The endocrine system includes specialized cells that help fight bacteria and viruses.
7. _____ High levels and long periods of stress can increase a person's risk for many diseases.
8. _____ Thirst is the body's response to the need for energy.
9. _____ Regardless of external conditions or activities, the body's internal temperature is almost exactly 37°C.
10. _____ The condensation of sweat from body surfaces cools the body.