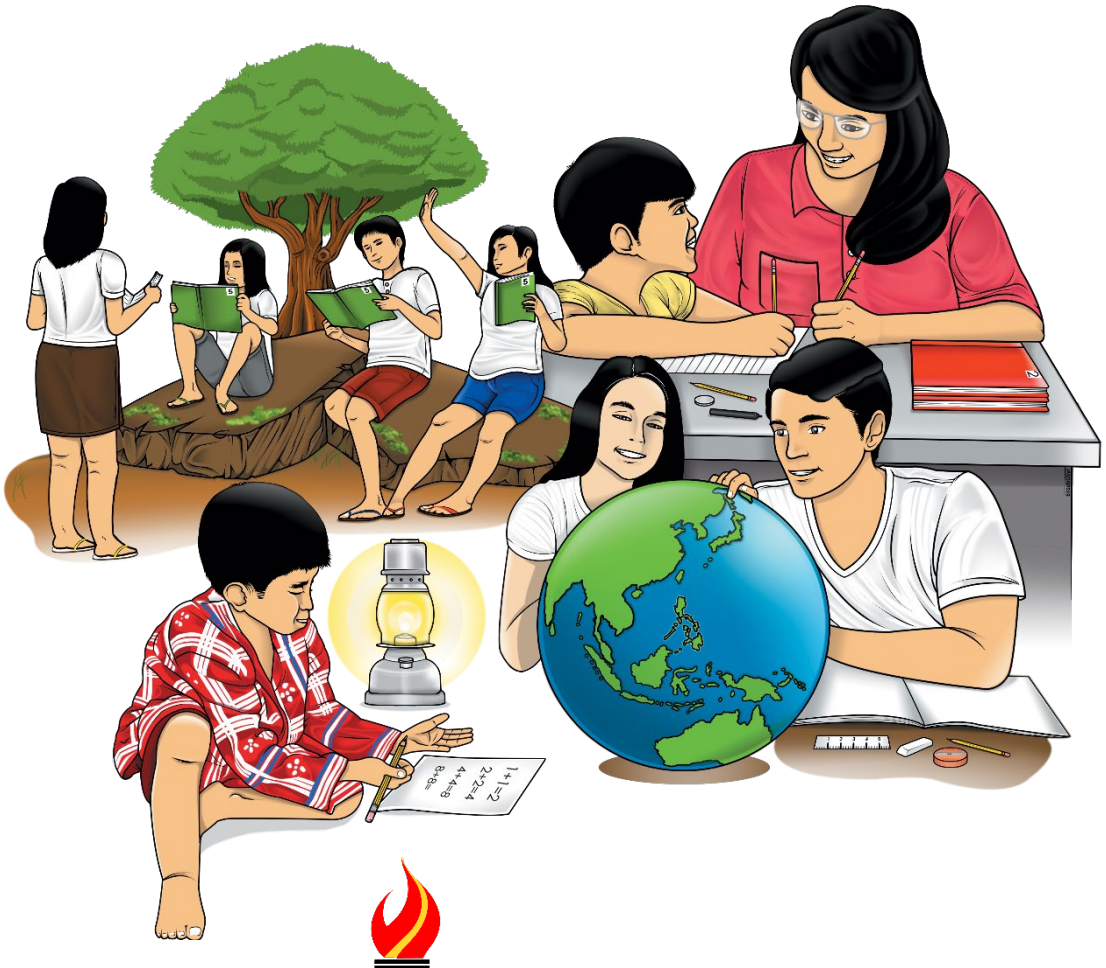
Senior High School

DepED
DEPARTMENT OF EDUCATION

Earth and Life Science

Quarter 2 – Module 7:
Organ Systems of Representative Animals



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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

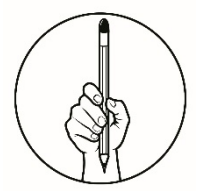
This module was designed and written with you in mind. It is here to help you master the nature of Organ Systems. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

The module is divided into three lessons, namely:

- Lesson 2 – Functional Relationships of the Different Organ Systems in Ensuring Animal Survival

After going through this module, you are expected to:

1. Identify the different function organ system of the representative animal; and
2. Explain the functional relationships of the different function organ system in ensuring animal survival.



What I Know

Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. Your body needs to send urine out of the body. Which systems are involved?
    A. Endocrine and excretory systems
    B. Excretory and muscular systems
    C. Muscular and digestive systems
    D. Nervous and endocrine systems
2. What two body systems are most useful in getting nutrients from the food that you eat?
    A. Circulatory and digestive systems
    B. Muscular and endocrine systems
    C. Nervous and circulatory systems
    D. Nervous and digestive systems
3. A student is outside on a very hot day. how does perspiration help maintain his body heat?
    A. It washes off bacteria off his skin.
    B. It prevents heat from entering his body.
    C. It causes evaporation and saves body heat.
    D. It causes evaporation and carries away body heat.
4. Feedback mechanisms that regulate sugar levels in the blood belong to which system?
    A. Digestive system
    B. Endocrine system
    C. Immune system
    D. Nervous system
5. The function of the cardiovascular or circulatory system is to transport blood throughout the body. What organ provides the force needed to transport or move to move the blood?
    A. Arteries
    B. Brain
    C. Capillaries
    D. Heart
6. The digestive system is to absorbing nutrients as the circulatory system is to?
    A. Removing nutrients
    B. Attracting nutrients
    C. Distributing nutrients
    D. Fighting infections
7. The immune system is to antibodies as the endocrine system is to?
    A. Hormones
    B. Marrow
    C. Nerve cells
    D. White blood cells

8. Hormones increase the heart rate of an animal in danger. This is a function of what organ system?
    A. Skeletal and circulatory
    B. Immune and endocrine
    C. Circulatory and endocrine
    D. Endocrine and respiratory
9. How does feedback mechanism maintain your body temperature when your surroundings are very hot?
    A. The brain sends a message to the skin. The muscles in the skin contract, or shiver, to cool the body.
    B. The muscles in the skin contract, which sends a message to the brain that you feel hot. The brain sends a message to the skin's heat receptors.
    C. Heat receptors in the skin send a message to the brain. The brain sends a response to start sweating, which cools the body.
    D. The skin starts sweating. The sweat sends a message to the brain, which sends a response to stop sweating.
10. What two organs make up the central nervous system?
    A. brain and spinal cord
    B. neurons and receptors
    C. cerebrum and cerebellum
    D. somatic nerves and autonomic nerves
11. Which body system is responsible for taking in oxygen and getting rid of carbon dioxide?
    A. cardiovascular system
    B. lung system
    C. lymphatic system
    D. respiratory system
12. Which statement describes the role of the nervous system in catching a baseball?
    A. It tells arm muscles to contract.
    B. It provides energy to arm muscles.
    C. It provides structure for arm muscles.
    D. It releases adrenaline and prepares the student to run.
13. What role does the endocrine system play in the body?
    A. It controls voluntary actions.
    B. It controls activities such as speaking, reading, and writing.
    C. It controls bodily functions by means of chemical messengers.
    D. It sends electrical messages along the spinal cord to muscles and glands.
14. Riding a bicycle requires additional energy from leg muscles. Which of the following conditions may result from this activity, and which response helps restore the body to its normal condition?
    A. increased salt wastes can be removed by the heart
    B. decreased oxygen can be replaced by digesting an apple
    C. increased sugars in the blood stream can be diluted by drinking water
    D. increased carbon dioxide in the blood can be removed by breathing faster
15. What is the major role of red blood cells in the circulatory system?
    A. prevent disease and fight infection
    B. carry digestive juices to the stomach
    C. carry nutrients and oxygen to body cells
    D. send chemical messages to the nervous system.

Lesson 2 Functional Relationships of the Different Organ Systems in Ensuring Animal Survival

Every day, you use your body to do a lot of things. Because of your body, you can think, move, play and generally go about your daily activities. There are lot of things happening inside your body that make life possible. You are alive because of the many wonderful systems of organs that work together perfectly through very complex processes. These organ systems keep in touch with one another, exchanging information and working together to keep you alive.

What's In

The body of an animal consist of various organ systems. Each contains several specific organs. An organ is a unique anatomic structure consisting of groups of tissues that work in concert to perform specific function.

System of the Body	***Major Organ***	***Function of the Organ System***
Digestive System	Esophagus, stomach, small intestine, large intestine, rectum	Processes foods and absorb nutrients, minerals, vitamins, and water.
Respiratory System	Nose, trachea, bronchi, lungs	Delivers air to sites where gas exchange can occur.
Circulatory System	Heart, blood vessels	Transports oxygen, nutrients and other substances to the cells and transport wastes, carbon dioxide and other substances away from the cells; help to stabilize body temperature and pH.
Urinary System	Kidneys, urinary bladder, ureter	Removes excess water, salts, and waste products from the blood and body and controls pH
Immune System	Bone marrow, thymus	Defends against microbial pathogens and other diseases
Nervous System	Brain, spinal cord	Collects, transfers and processes information and directs short term change in other organ systems.
Endocrine System	Glands produce hormones	Provides communication within the body via hormone and direct long-term change in other organ systems to maintain homeostasis
Muscular System	Muscles, tendons	Provides movement, support and heat production
Skeletal System	Bones, cartilages, ligaments	Supports and protects soft tissues of the body; provide movement at joints; produces blood cells

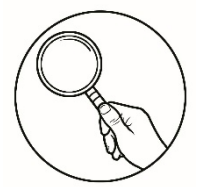
What's New

There are various systems in the animal's body: muscular system, respiratory system, digestive system, skeletal system, circulatory (or cardiovascular) system, excretory (or urinary) system, reproductive system, nervous system, Immune system, and endocrine system. Each system has a special job. All of the body systems have to work together to keep them healthy. The bones and muscles work together to support and move the body. The respiratory system takes in oxygen from the air. It also gets rid of carbon dioxide. The digestive system absorbs water and nutrients from the food we eat. The circulatory system carries oxygen, water, and nutrients to cells throughout the body. Wastes from the cells are eliminated by the respiratory system, the excretory system, and the skin. The nervous system controls all these activities with electrical impulses. If any system in the animals isn't working properly, other systems are affected.

ACTIVITY 1. Matching Type

Directions: Match Column A with the description on Column B. Write the letter of the correct answer on the space provided before the number.

COLUMN *A*	**COLUMN B.**
_____1. Digestive system and Muscular System	A. These systems interact when food is pushed down the esophagus to the stomach.
_____2. Muscular System and Respiratory System	B. These systems interact when the kidneys filter materials out of the body.
_____3. Urinary System and Circulatory System	C. These systems interact to allow the inhalation and exhalation of gases in the lungs through the help of accessory muscles.
_____4. Endocrine System and Nervous System	D. These systems interact when glands of the brain control functions of the body.
_____5. Respiratory system and Circulatory system	E. Takes oxygen for the delivery to cells and removes carbon dioxide brought from the cell
_____6. Endocrine System and Skeletal System	F. Hormone increases the heart rate of an animal in danger
_____7. Digestive System and Circulatory System	G. The brain sends signals that the person needs to go to the bathroom for urination.
_____8. Immune System and Skeletal System	H. Bone marrow produces red blood cell.
_____9. Nervous System and Urinary System	I. Protein and sugar travel from the intestines directly to blood.
_____10. Endocrine System and Circulatory System	J. The hormone testosterone increases the bone density of a growing male.



What is It

Each Body System Works with the Others

Each individual body system works in conjunction with other body systems. The circulatory system is a good example of how body systems interact with each other. The heart pumps blood through a complex network of blood vessels. When the blood circulates through the digestive system, for example, it picks up nutrients the body absorbed from the last meal. The blood also carries oxygen inhaled by the lungs. The circulatory system delivers oxygen and nutrients to the other cells of the body then picks up any waste products created by these cells, including carbon dioxide, and delivers these waste products to the kidneys and lungs for disposal. Meanwhile, the circulatory system carries hormones from the endocrine system, and the immune system's white blood cells that fight off infection.

Each of the body systems relies on the others to work well. The respiratory system relies on the circulatory system to deliver the oxygen it gathers, while the muscles of the heart cannot function without the oxygen they receive from the lungs. The bones of the skull and spine protect the brain and spinal cord, but the brain regulates the position of the bones by controlling the muscles. The circulatory system provides the brain with a constant supply of oxygen-rich blood while the brain regulates the heart rate and blood pressure.

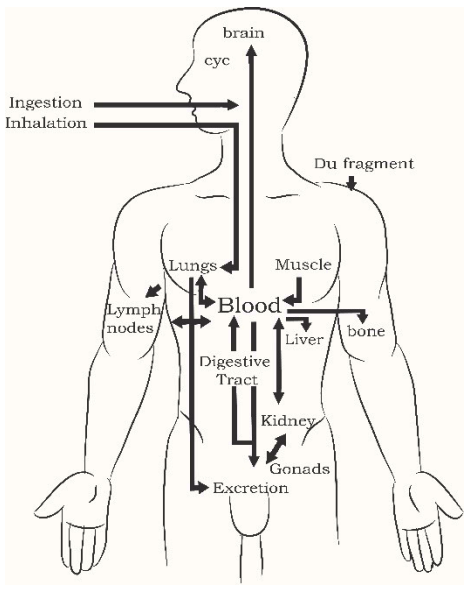


Fig. 1 How the Human Body Systems work

Even seemingly unrelated body systems are connected. The skeletal system relies on the urinary system to remove waste produced by bone cells; in return, the bones of the skeleton create structure that protects the bladder and other urinary system organs. The circulatory system delivers oxygen-rich blood to the bones. Meanwhile, the bones are busy making new blood cells. Working together, these systems maintain internal stability and balance, otherwise known as homeostasis.

What's More

Each organ system interacts with at least one other organ system. Organ systems do not work independently; organ systems interact with each other to keep the organism functioning. The systems of the body are interdependent. The job that one system carries out depends on and influence jobs carried out by other systems.

Activity 1

Complete the table below by listing the body systems that interact together for each scenario described.

SYSTEMS	INTERACTION
1.	Lungs supply oxygen carried by the blood to cells of the body
2.	Nutrients pass into the circulatory system to be carried to body cells
3.	Kidneys remove wastes from blood
4.	Movement of the diaphragm in breathing
5.	Production of blood cells in bone marrow
6.	Daily movement and coordination
7.	Pumping of the heart & blood
8.	Chewing, swallowing and movement of food through the digestive tract
9.	Pulmonary vein brings blood from the lugs back to the heart
10.	Muscles in the leg cause the tibia and fibula bones to move upward

Question:

1. How do they all function together?

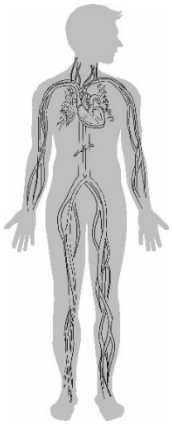
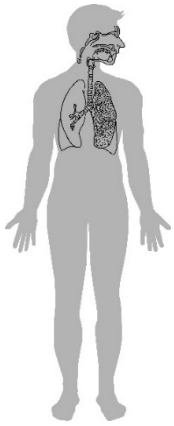
_____

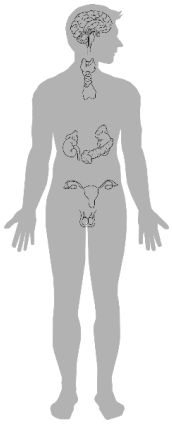
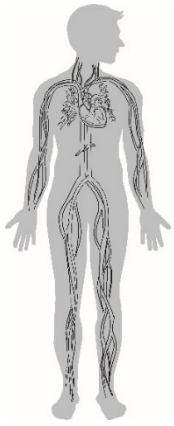
_____

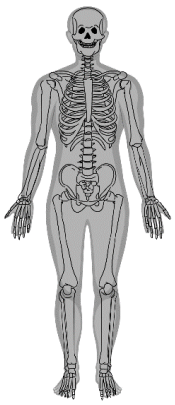
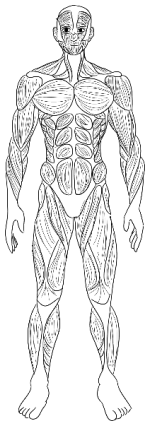
_____

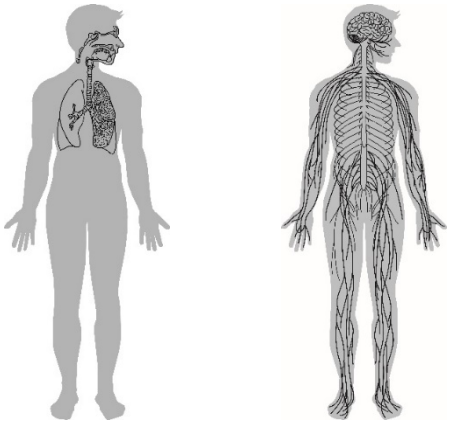
Activity 2

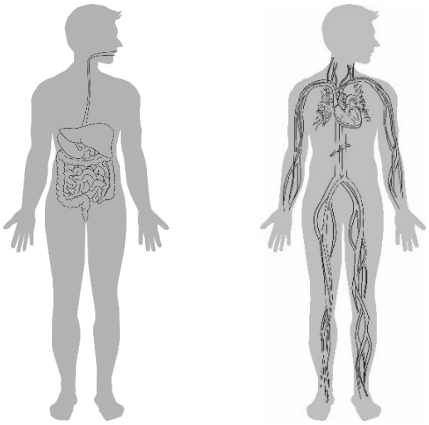
The human body systems interact to perform several functions for the whole organism. Give the functions of the body when two systems work together.

1.  

2.  

3.  

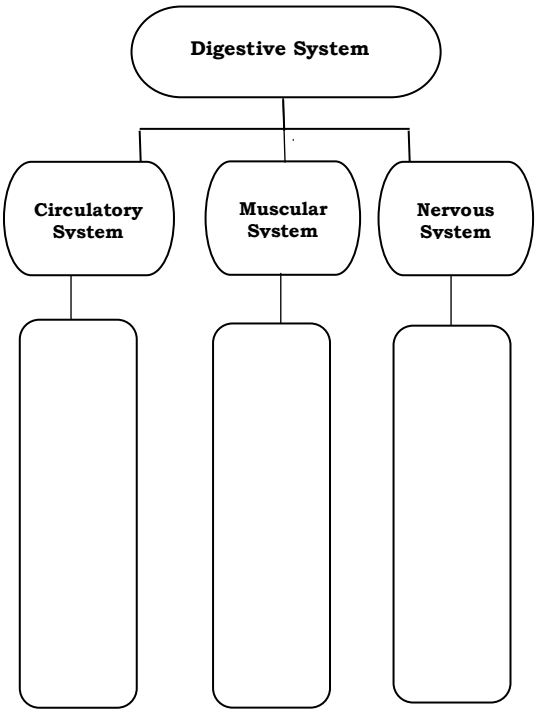
4. 

5. 

Activity 3

Complete the table by writing the relationship of the given organ to the different organs of the body.

1.



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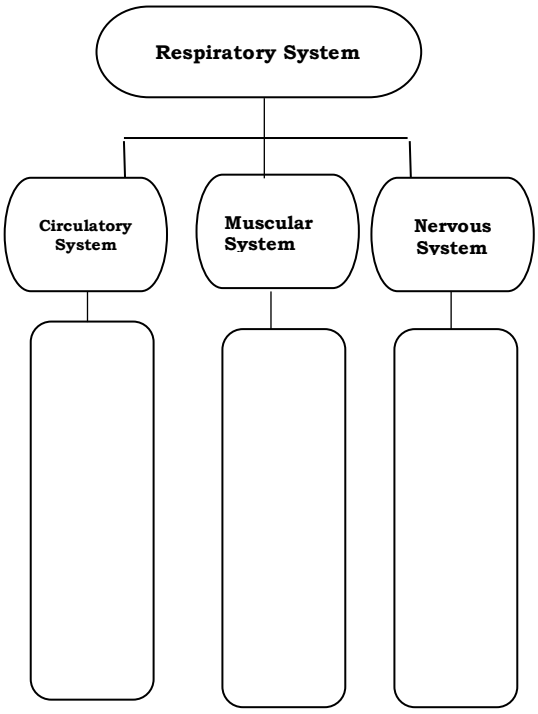

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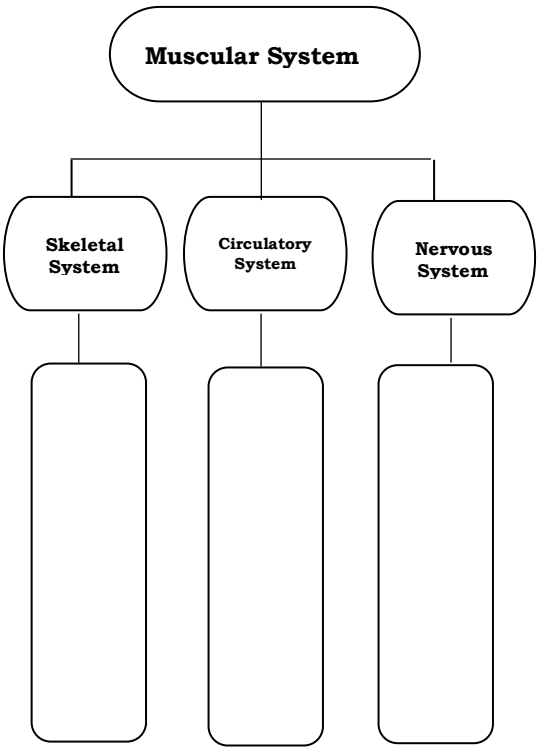
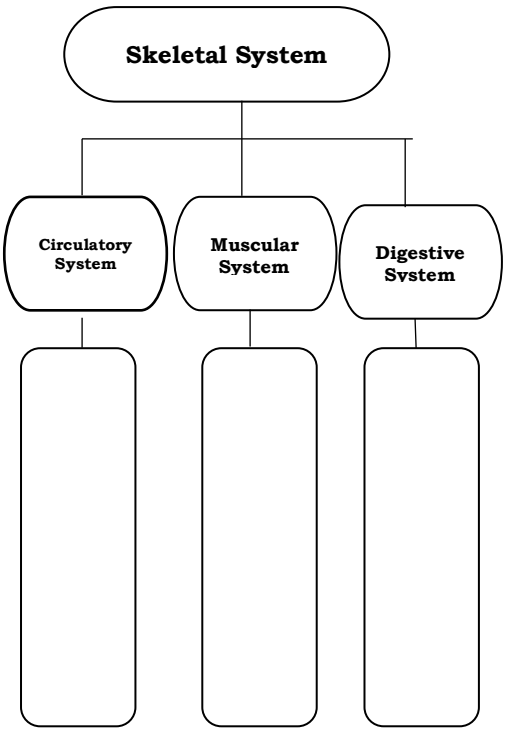
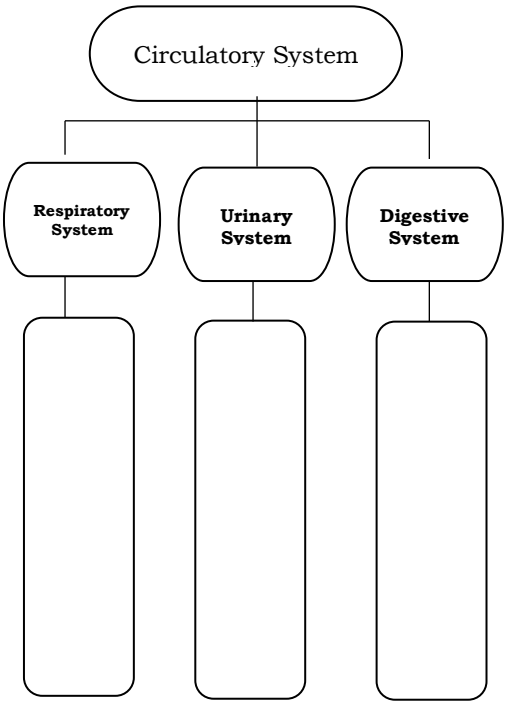

Muscular System
Skeletal System
Circulatory System
Nervous System

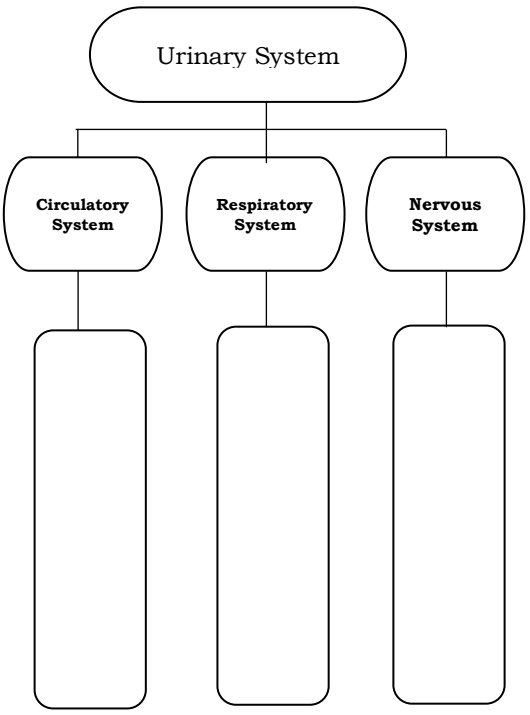
4.


Skeletal System
Circulatory System
Muscular System
Digestive System

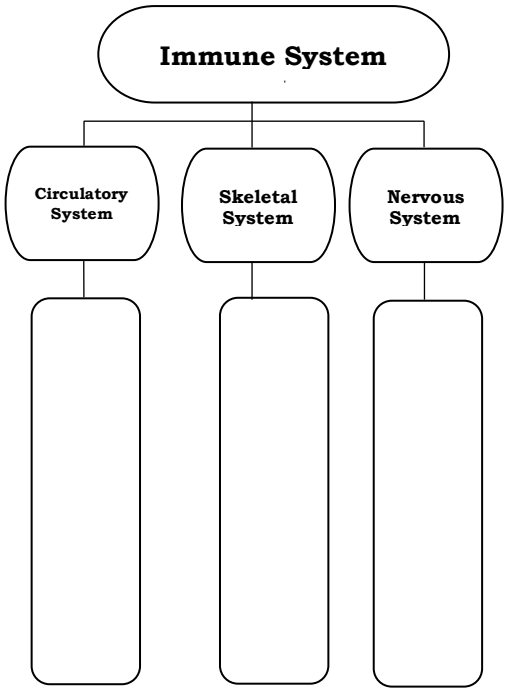
5.


Circulatory System
Respiratory System
Urinary System
Digestive System

6.


Urinary System
Circulatory System
Respiratory System
Nervous System

7.



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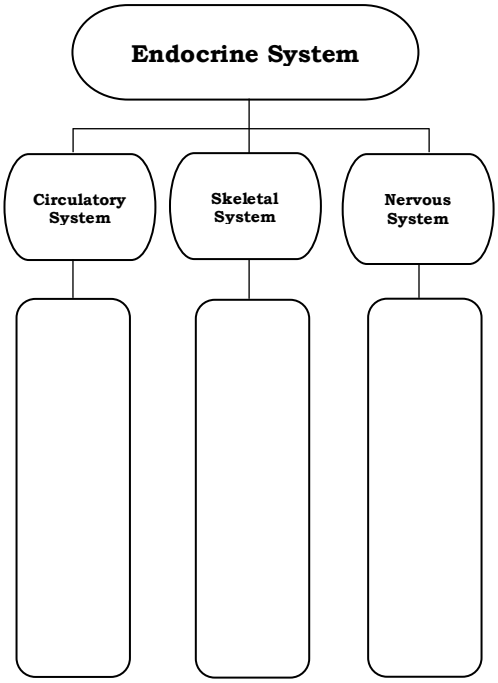
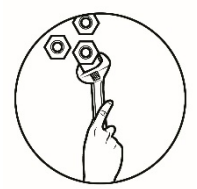


What I Have Learned

Directions: Supply the missing word to complete the sentence. Write your answers on a separate sheet of paper.

1. The digestive system relies on the _____system to deliver the nutrients to the entire body of the organism.
2. The respiratory system provides oxygen to the _____system.
3. Carbon dioxide from cells is delivered from the circulatory system back to the_____ system so it can exit the body.
4. The circulatory system carries the waste from throughout the organism to the _____ system, which takes care of excreting the waste from the organism.
5. The circulatory system and the _____system interact to deliver oxygen to and to remove carbon dioxide from cells.



What I Can Do

Answer the following questions. Write your answers on a separate sheet of paper.

1. How will you protect your body from pathogens?

_____
_____
_____
_____

2. Write a paragraph on how your body system is working together?

While I am (cite your activity) _____ here is how my body systems are working together.

_____
_____
_____
_____

Assessment

Choose the letter of the correct answer. Write the chosen letter on a separate sheet of paper.

1. Which of the following is an example of the endocrine system directly interacting with the nervous system?
   A. The vertebrae protect the spinal cord from injury
   B. Hormones provide feedback that affects neutral processing
   C. Sensory receptors in bones send signals about body position to the brain
   D. The brain sends signals that control the speed at which food moves through the intestines.

2. During the final stages of human gestation, receptors for the hormone oxytocin increase on the smooth muscle cells of the uterus. The release of the oxytocin during labor stimulates the smooth muscle tissue in the wall of the uterus. The vigorous contraction of the uterine smooth muscle helps push the baby through the birth canal so that delivery can occur. This process involves the interaction of which organ system?
   A. Endocrine and reproductive only
   B. Endocrine and muscular only
   C. Endocrine, muscular and reproductive
   D. Endocrine, reproductive, and excretory

3. Kidneys are part of the excretory system. They purify the impure blood and send it back to the rest of the body. Which system is mainly responsible for the transport of plasma to the kidneys?
   A. Circulatory systems
   B. Respiratory systems
   C. Nervous systems
   D. Muscular systems

4. What two body systems are most useful in getting nutrients from the food that you eat?
   A. Muscular and endocrine systems
   B. Nervous and digestive system
   C. Nervous and circulatory systems
   D. Circulatory and digestive systems

5. What two systems work together to provide body cells with a constant supply of oxygen while removing carbon dioxide waste?
   A. Circulatory and respiratory systems
   B. Muscular and circulatory systems
   C. Nervous and circulatory systems
   D. Nervous and immune systems

6. Which of the following describes an interaction that occurs between two body systems of a rabbit that helps the rabbit outrun a pursuing coyote?
   A. The endocrine system releases hormones that prepare the immune system to deal with the possible injuries.
   B. The digestive system increases the rate of digestion, and the excretory system ceases to provide tissues with more nutrients.
   C. The respiratory system increases the breathing rate, and the circulatory system increases blood pressure to provide tissues with more oxygen.
   D. The skeletal system releases additional calcium, and the circulatory system retains more sodium in the blood to provide muscles with ions for contraction.

7. The human digestive system is approximately 900 cm long. Food is moved through the digestive tract primarily by
   A. Muscular contractions
   B. Bile produces by the pancreas
   C. The enzyme amylase and pepsin
   D. Hydrochloric acid by the stomach

8. The digestive system is to absorbing nutrients as the circulatory system is to?
   A. Removing nutrients
   B. Attracting nutrients
   C. Distributing nutrients
   D. Fighting infections

9. How do circulatory system and immune system work together to respond to an injury?
   A. Increased blood flow carries white blood cells to the site of the injury.
   B. Increased blood flow kills healthy cells which prevents infection at the site of the injury.
   C. Increased blood flow allows for an increase in the exchange of carbon dioxide and oxygen at the site of the injury.
   D. Increased blood flow removes infected cells from the body at the site of the injury.

10. Which body systems must directly interact for a vertebrate organism to exchange gases?
    A. Circulatory and respiratory
    B. Endocrine and respiratory
    C. Immune and endocrine
    D. Skeletal and circulatory

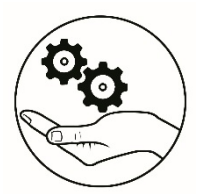
11. A deer hears a predator approaching and begins to run for safety. The deer has primarily engaged what body system to escape?
    A. Muscular, reproductive and circulatory system
    B. Muscular, digestive, and immune system
    C. Nervous, respiratory, and muscular system
    D. Respiratory, endocrine and excretory system

12. Which two systems alert the young bird from danger and help produce the vomit it uses as a defense?
    A. Excretory and immune
    B. Muscular and digestive
    C. Nervous and digestive
    D. Urinary and muscular

13. Which of the following is an example of the endocrine system directly interacting with the nervous system?
    A. The vertebrae protect the spinal cord from injury
    B. Hormones provide feedback that affects neuron processing
    C. Sensory receptors in bones send signals about body position to the brain
    D. The brain sends signal that control the speed at which food moves through the intestines

14. Which body systems work together to protect the body from pathogens?
    A. Circulatory and immune
    B. Digestive and excretory
    C. Endocrine and reproductive
    D. Muscular and vascular

15. How does the digestive system work with all other systems?
    A. The digestive system allows the body to move
    B. The digestive system puts oxygen into the body
    C. The digestive system gives the body energy and nutrients
    D. The digestive system transport blood to all the other systems



Additional Activities

Reflection: You can't have one without the other: How can you relate this to your body systems?

Answer Key

What I Know

1. B
2. A
3. D
4. B
5. D
6. C
7. A
8. C
9. C
10. A
11. D
12. D
13. C
14. D
15. C

What's New

1.	A	6.	H
2.	C	7.	I
3.	B	8.	J
4.	D	9.	G
5.	E	10.	F

What's More

Activity 1

1. respiratory and circulatory
2. digestive and circulatory
3.urinary and circulatory
4. respiratory and muscular
5. immune and skeletal
6. muscular and nervous
7. Muscular and circulatory

What's More

Activity 2

1. The circulatory system carries nutrient to different part of the body from the digestive system
2. The excretory system filters waste out of the blood
3. The muscular system allows movement of the bones
4. The circulatory system takes the oxygen for delivery to cells and removes carbon dioxide
5. The circulatory transport the antibodies to fight invaders.

What I Have Learned

1. Circulatory System
2. Organ System
3. Respiratory System
4. Urinary System
5. Respiratory System

Assessment

1. B
2. C
3. A
4. D
5. A
6. C
7. A
8. C
9. A
10. A

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