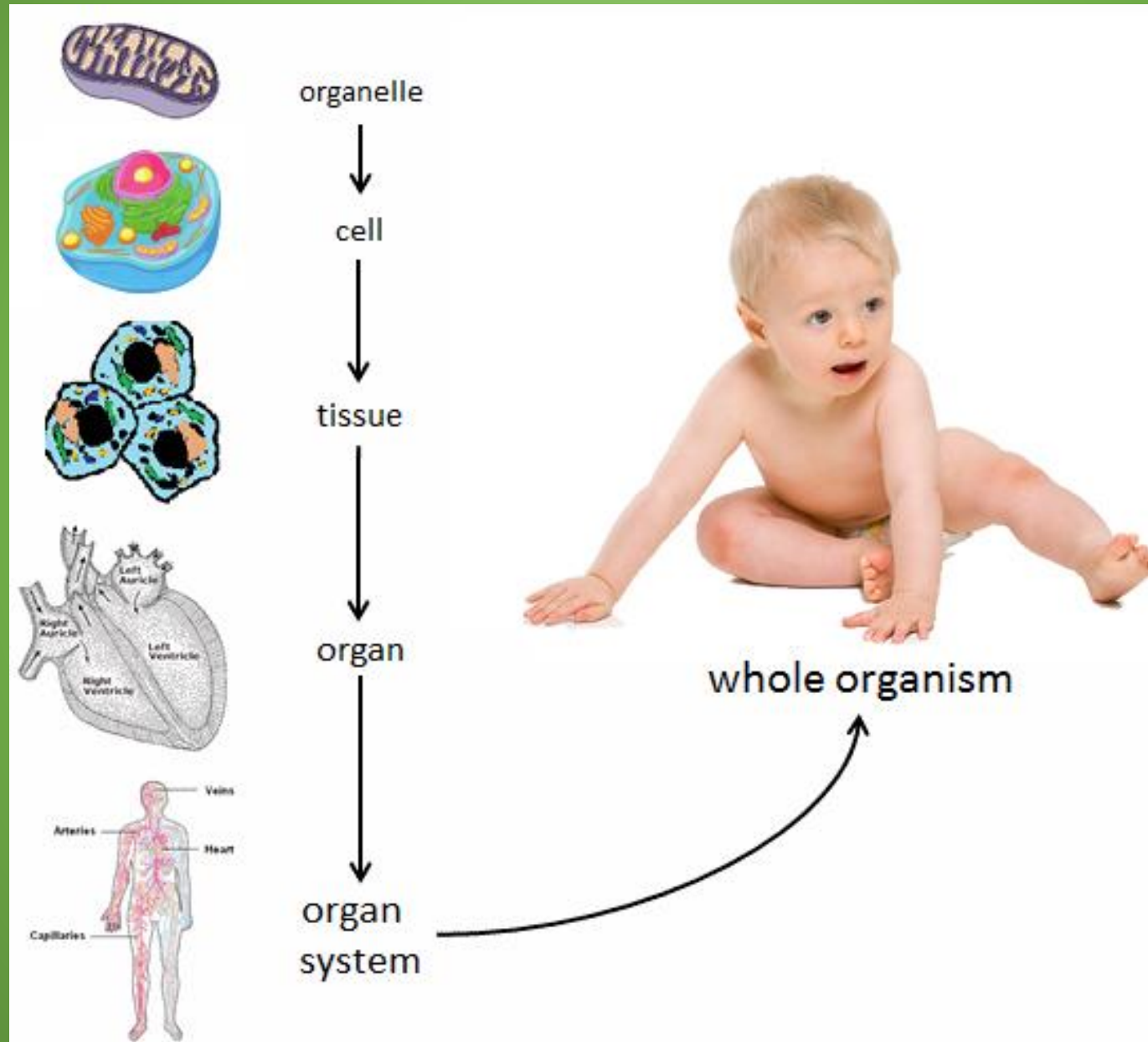


# Order of Complexity in living things



# Test Practice

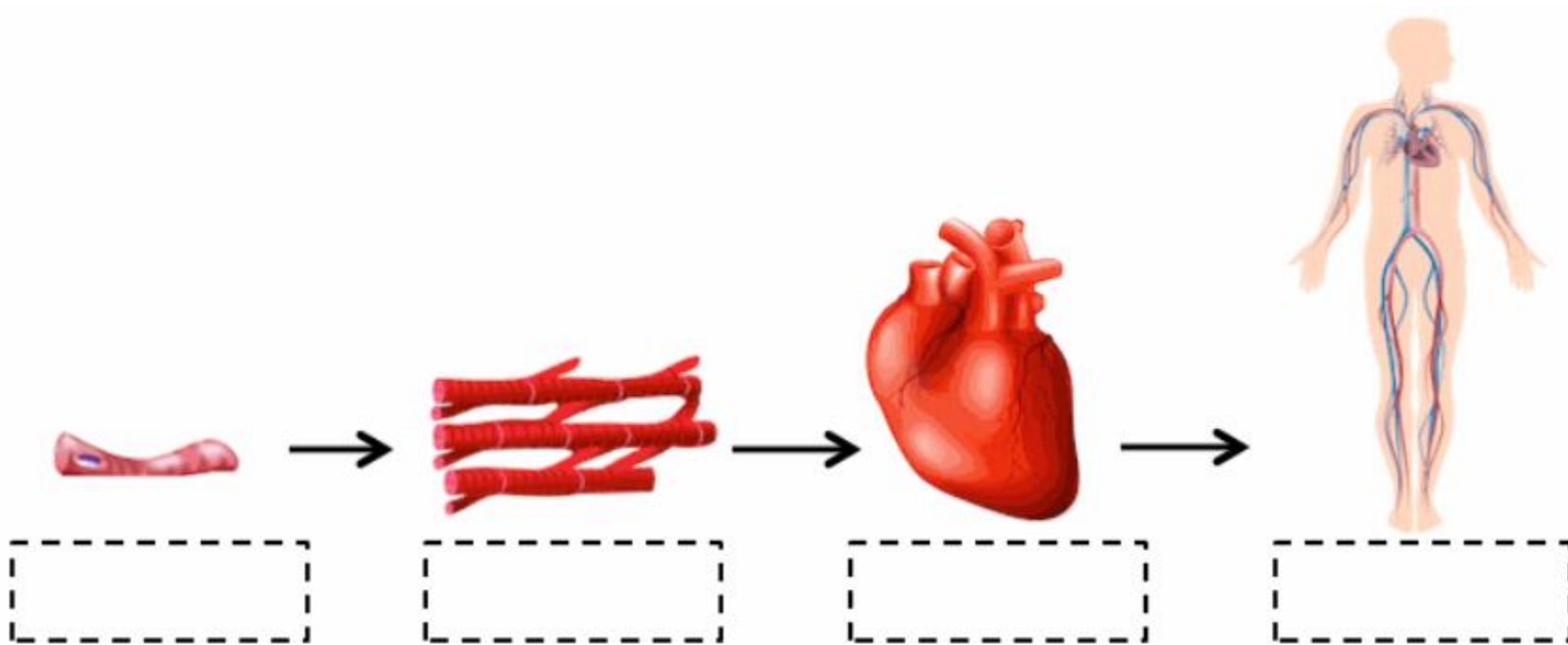
Multicellular organisms exhibit a hierarchy of cellular organization. The diagram below shows four levels of cellular organization, organized from the simplest level to the most complex level. Use the labels to identify the level of organization represented by each image.

tissue

organ system

cell

organ



# Organ Systems Notes

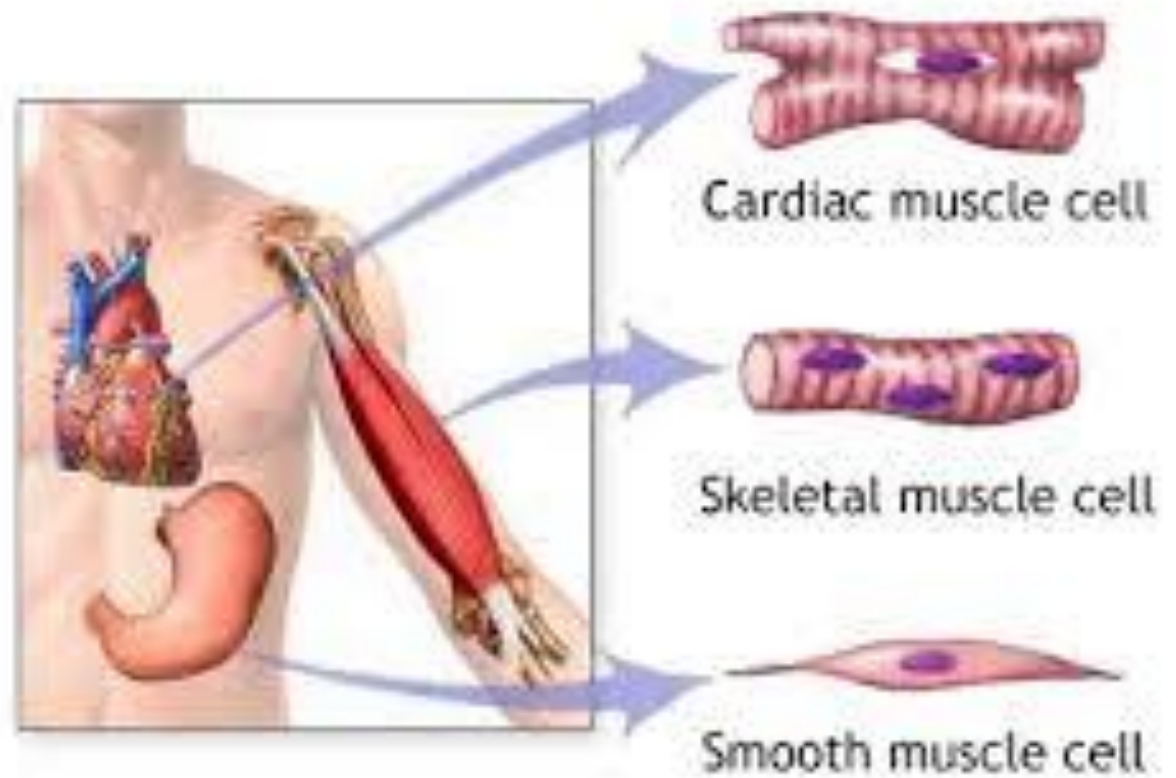
# Muscular System

- Function
  - Helps you move
    - Posture
    - Internal organs
    - Heart contraction
  - Moves materials through the body
    - Food through Digestive System



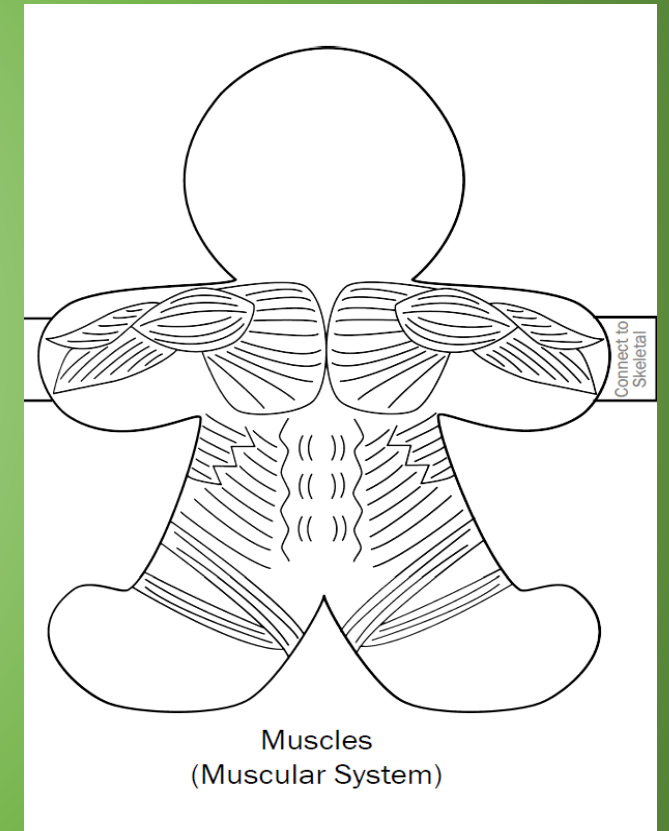
# Muscular System

- Main Organs/ Parts
  - Skeletal Muscle
  - Cardiac Muscle (Heart)
  - Smooth Muscle (Rest of body)



# Organ System Teamwork

- Circulatory – brings nutrients to the muscles, takes away waste
- Digestive – Moves food
- Respiratory – Diaphragm muscles causes lungs to inflate and deflate
- Skeletal – Creates a frame for your bones to connect
- Nervous – Controls contractions and speed of muscles



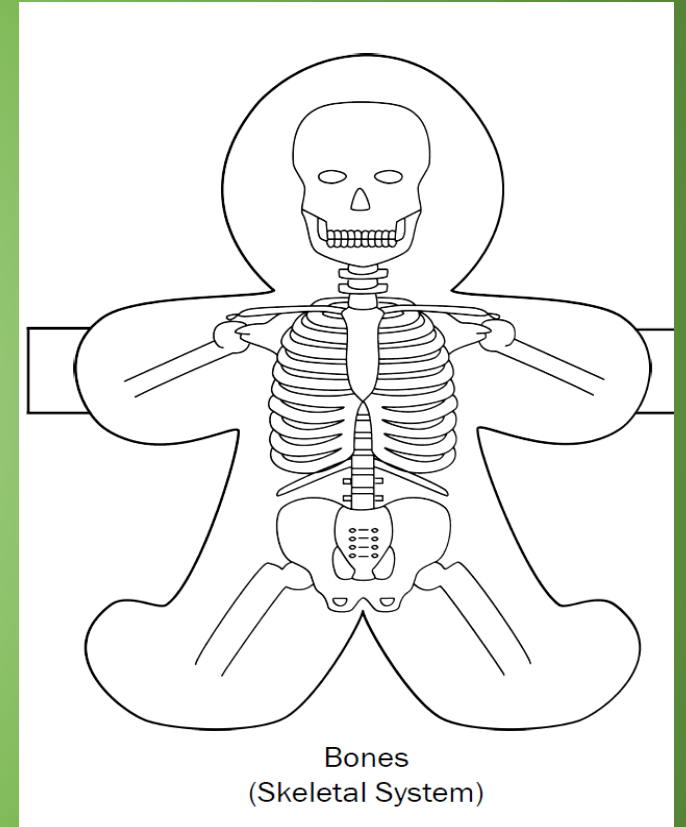
# Test Practice

The muscles of the body are part of the muscular system but would not operate without the \_\_\_\_\_ system providing the impulses that cause the muscles to act.

- A. respiratory
- B. reproductive
- C. cardiovascular
- D. nervous

# Skeletal System

- Function:
  - Body Support
  - Help movement
  - Protect internal organs

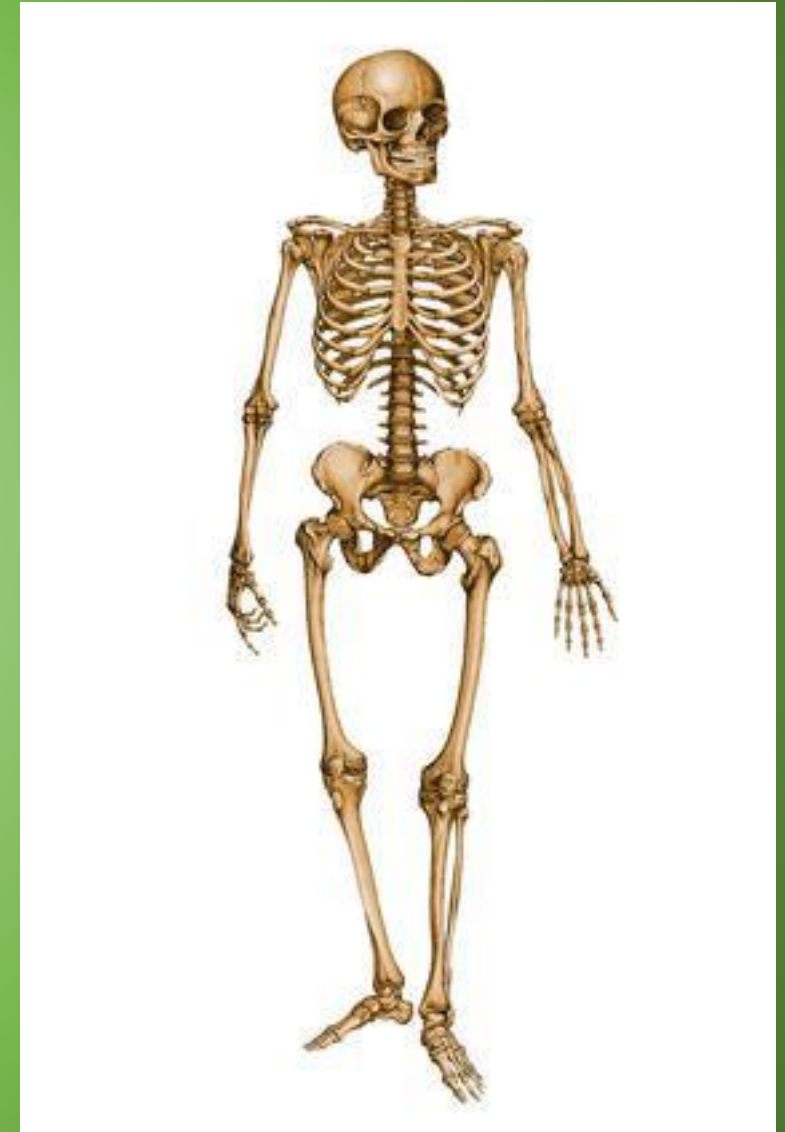




# Skeletal System

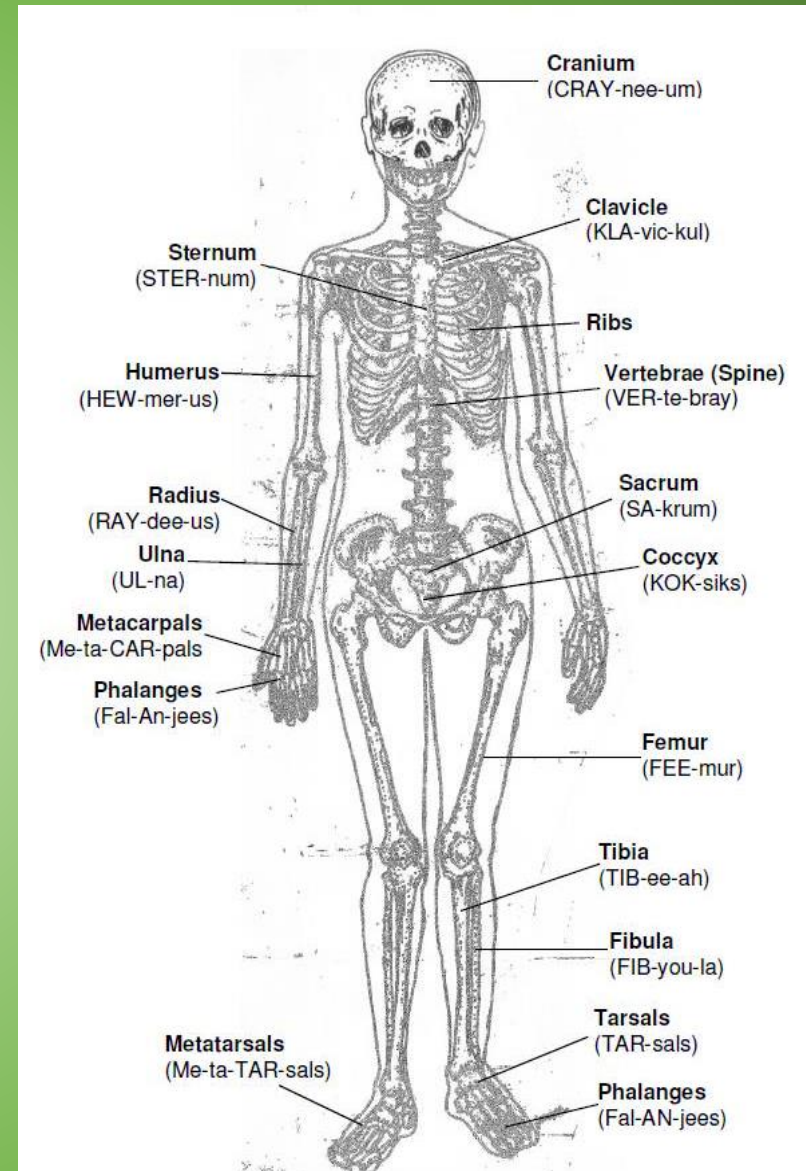
Main parts:

- Bones
- Cartilage
- Ligaments/Tendons
- Joints
- Skull
- Spinal Cord
- Rib Cage



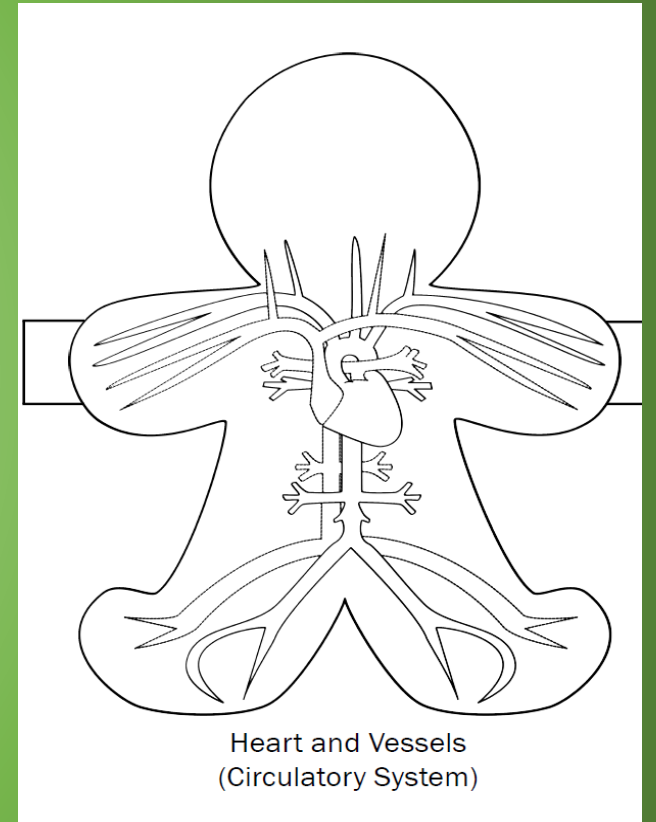
# Skeletal System Interactions

- Respiratory – protects the lungs
- Muscular – provides form, support, stability, movement
- Circulatory – Protects heart, bones produce blood
- Endocrine – hormones speed up growth and maintain bone loss
- Nervous – Protects brain, bones make calcium (which nervous system needs)



# Circulatory (Cardiovascular) System

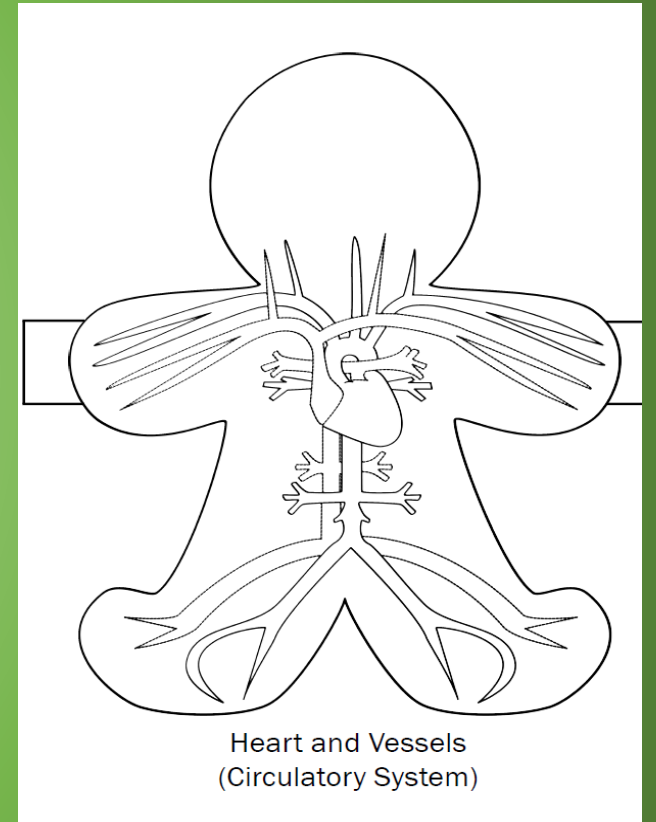
- Function
  - Blood Circulation
  - Transports nutrients
  - Gets rid of waste



# Circulatory (Cardiovascular) System

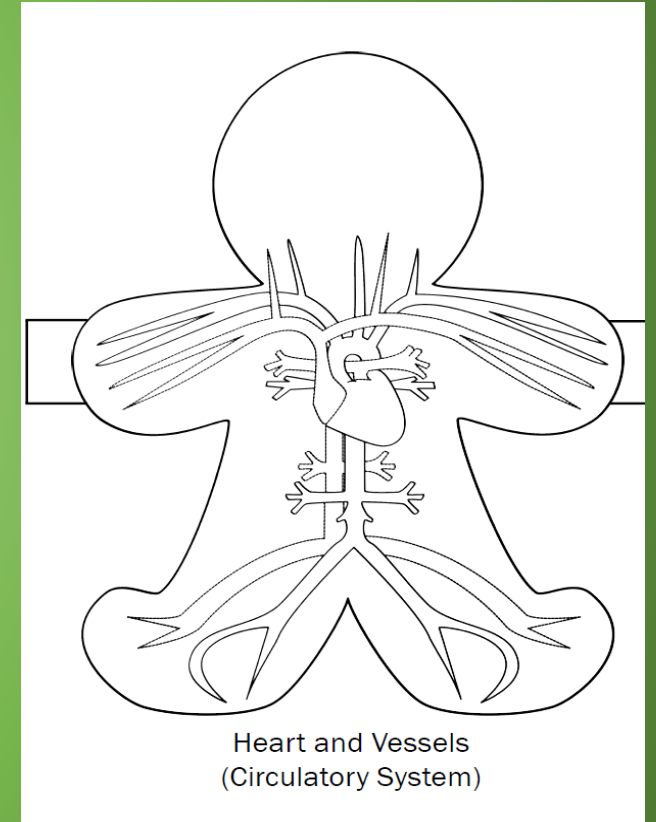
- Main Parts

- Heart
- Lungs
- Veins (blood TO heart)
- Arteries (blood AWAY from heart)
- Capillaries



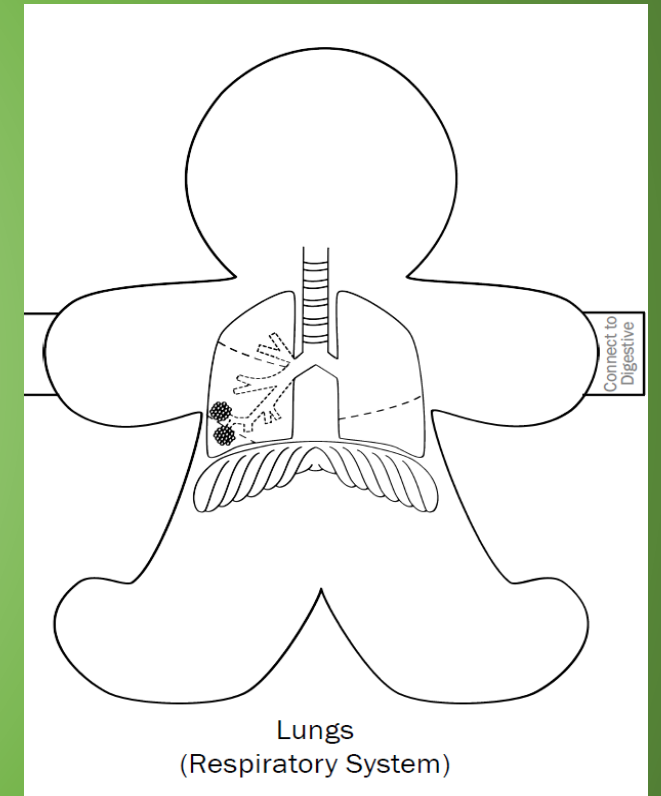
## Interactions with other systems:

- Nervous – regulates the rate of blood pumping
- Respiratory – uses circulatory to deliver oxygen to the body
- Muscular – transports blood to the muscles to give energy
- Digestive/Endocrine – gets absorbed nutrients/hormones to the rest of body
- Integumentary – opens/closes capillaries to regulate body temperature
- Skeletal system creates the blood



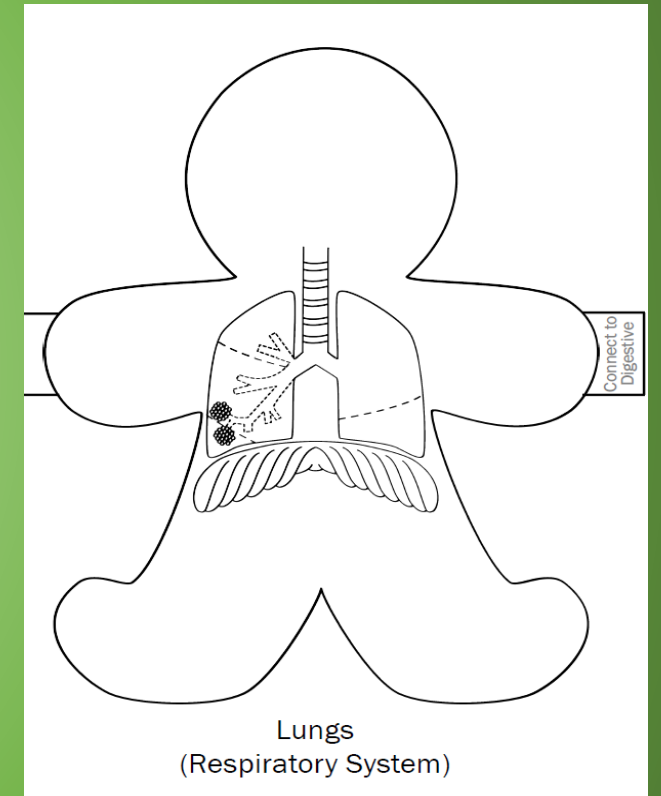
# Respiratory System

- Function
  - Removes carbon dioxide
  - Gathers oxygen
  - (EXCHANGE of gases)



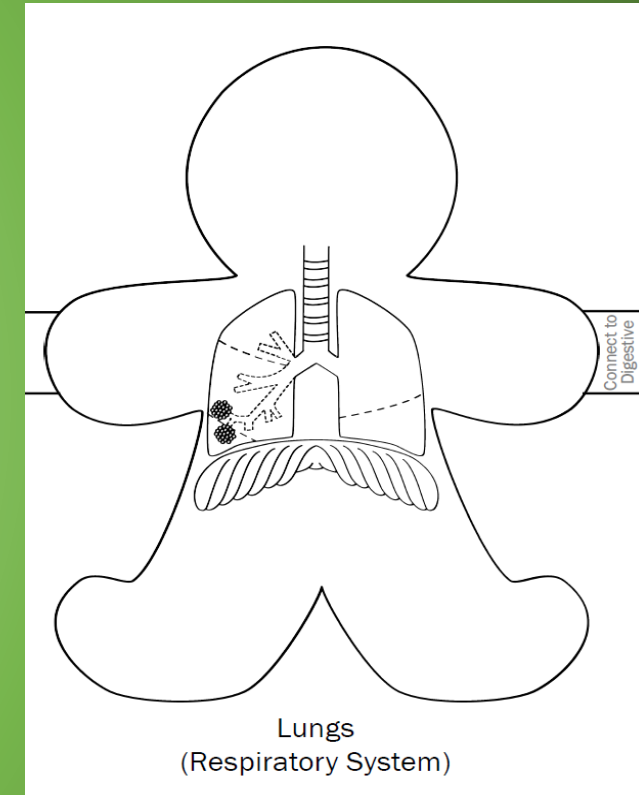
# Respiratory System

- Main parts
  - Lungs
  - Nose
  - Diaphragm (muscle)
  - Heart



# Interactions with other systems:

- Circulatory – transports oxygen to cells and carbon dioxide from cells
- Immune – mucus created by immune system protects the lungs
- Muscular – diaphragm pushes air in and out
- Skeletal – ribs protect lungs
- Nervous – monitors blood-gas levels and signals to take in more oxygen
- Excretory – get rid of carbon dioxide and water vapors





# Test Practice

The job of the human heart is to circulate blood through all of the body's arteries, capillaries, and veins. The job of the human lungs is to supply the small amount of blood in them with oxygen.

The interaction of these two parts of the human body results in a system that

- A.** turns the protein in blood into food energy for the digestive system.
- B.** breaks down food energy, and turns it into heat.
- C.** circulates oxygen-filled blood throughout the body.
- D.** removes old blood from the body.

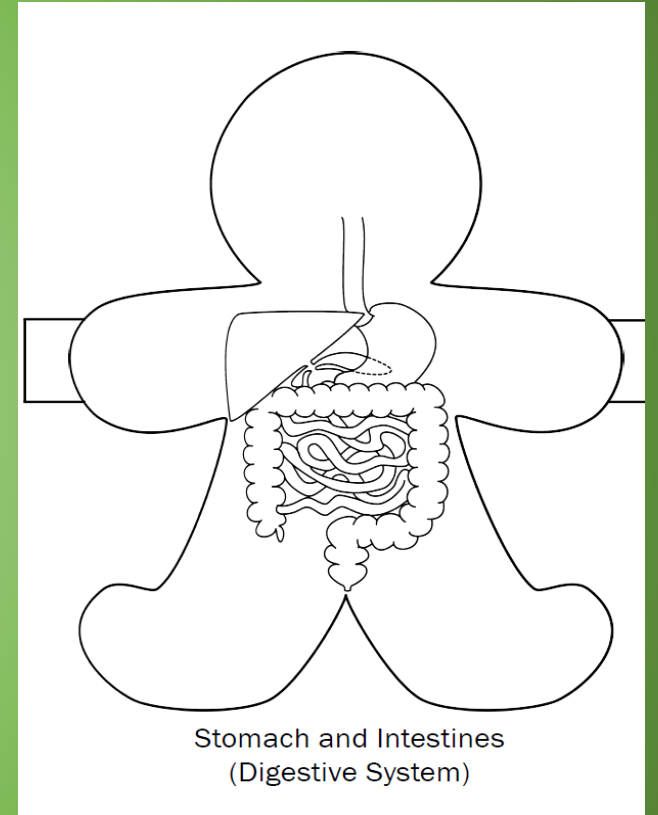
# Test Practice

The cardiovascular and respiratory systems interact to

- A.** digest and transport food to cells in all parts of the body.
- B.** sense and react to changes in the environment.
- C.** send and receive messages to and from all parts of the body.
- D.** transport and exchange gases needed by cells in all parts of the body.

# Digestive System

- Function
  - Takes food & breaks it down into nutrients that can be absorbed



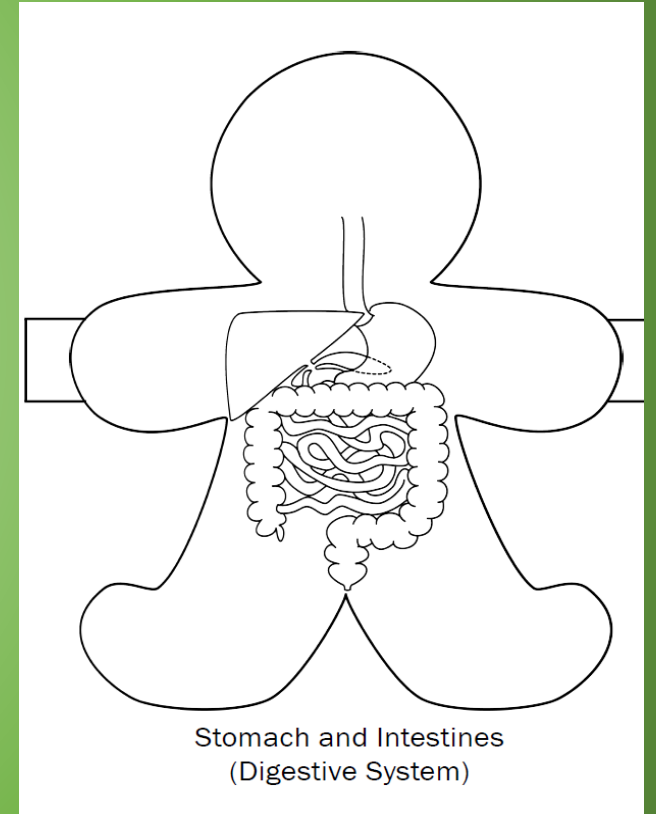
# Digestive System

- Main parts:
  - Mouth
  - Esophagus
  - Stomach
  - Large/Small Intestines
  - Liver



## Interactions with other systems:

- Circulatory – helps transport nutrients to the body's cells
- Excretory – removes undigested food and controls amount of water
- Respiratory – provides oxygen to the digestive
- Muscular- moves food through the system
- Nervous – controls eating and drinking
- Endocrine – makes a hormone that affects digestion

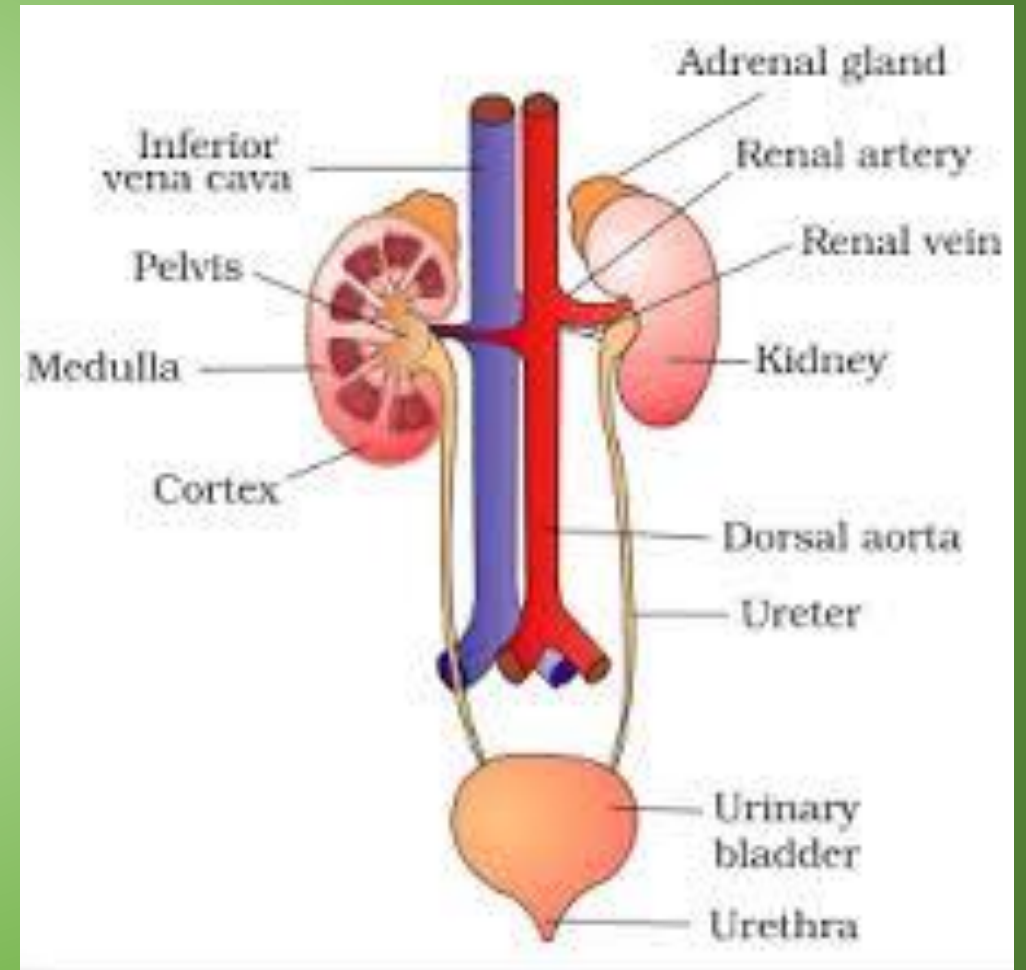


# Test Practice

The  system breaks down food, and the  system transports nutrients to the cells of the body.

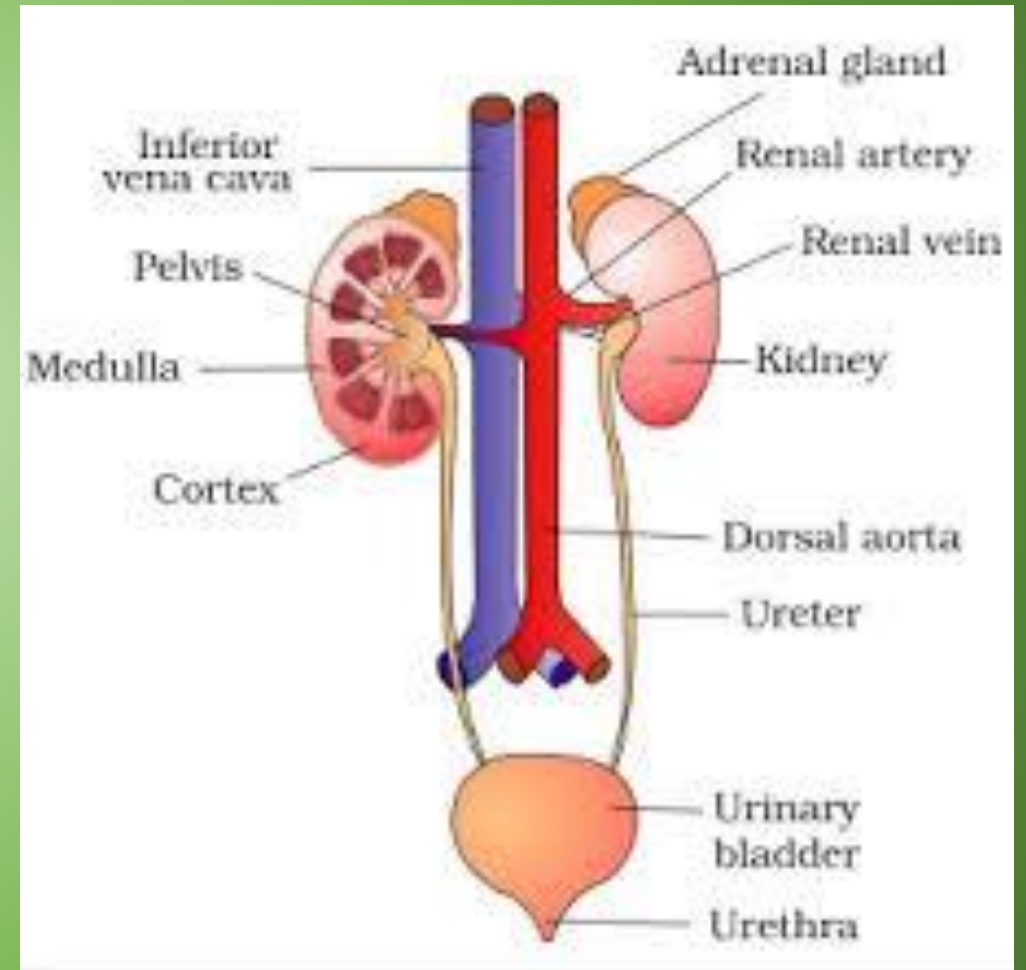
# Excretory System

- Functions
  - Removes wastes
  - Controls blood (removes wastes)
  - Regulates body fluids



# Excretory System

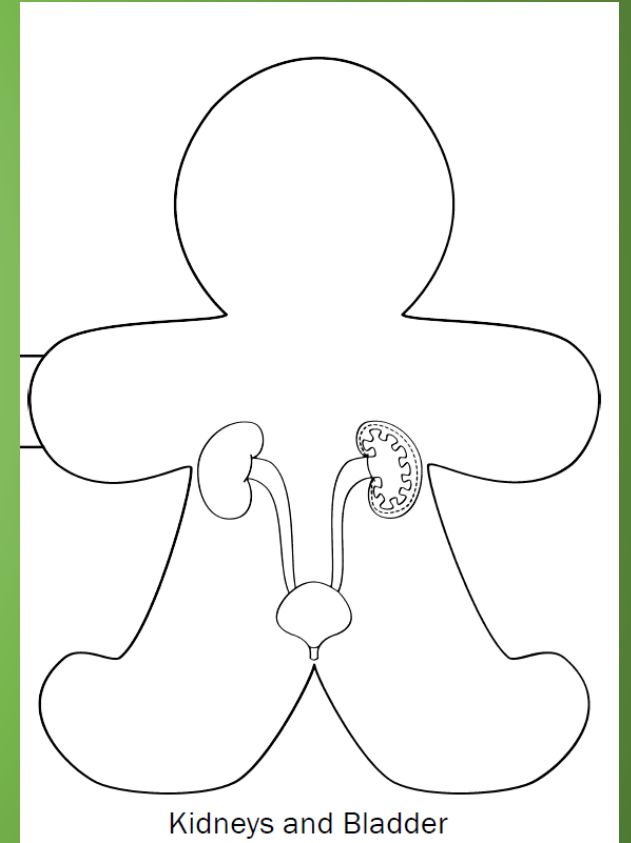
- Main Parts
  - Kidneys
  - Large Intestine
  - Liver
  - Urinary bladder





# What system does it interact with:

- Digestive – collects and removes undigested solids
- Respiratory – supplies oxygen, gets rid of carbon dioxide
- Circulatory – Kidneys filter unneeded liquids from blood stream into urine
- Endocrine – uses excretory to get rid of waste from glands



# Test Practice



circulatory system



digestive system



nervous system



respiratory system

Which two body systems pictured above interact with each other to break down and transport the nutrients found in food?

- A. the digestive system and the nervous system
- B. the cardiovascular system and the digestive system
- C. the nervous system and the respiratory system
- D. the respiratory system and the cardiovascular system

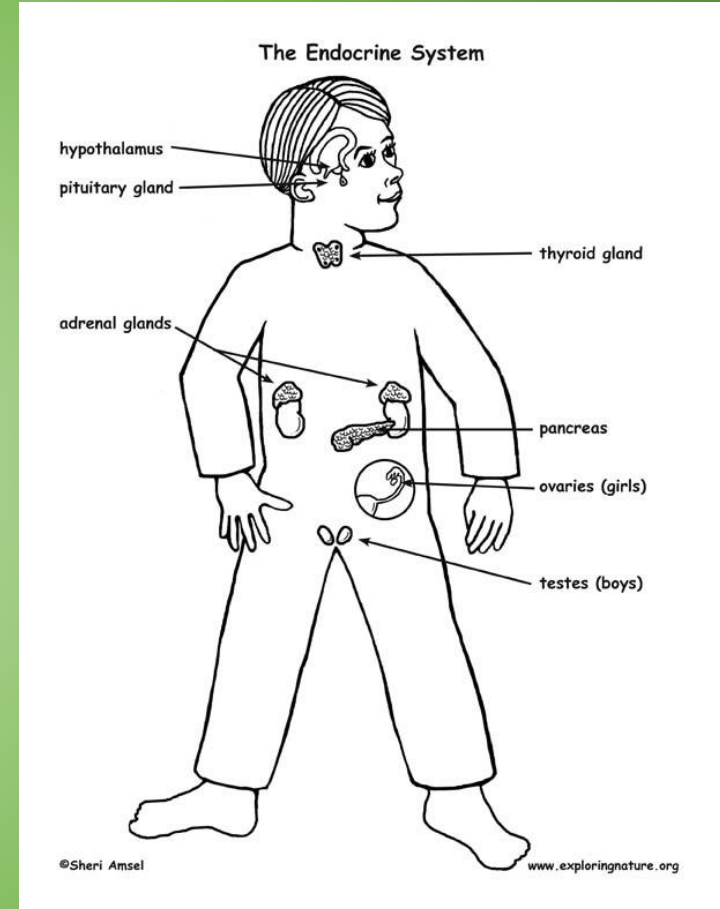
# Test Practice

Blood found in the circulatory system transports many materials, including nutrients, gases and wastes. Which of the following body systems interacts with the circulatory system to get rid of wastes found throughout the body?

- A.** the nervous system
- B.** the excretory system
- C.** the digestive system
- D.** all of these

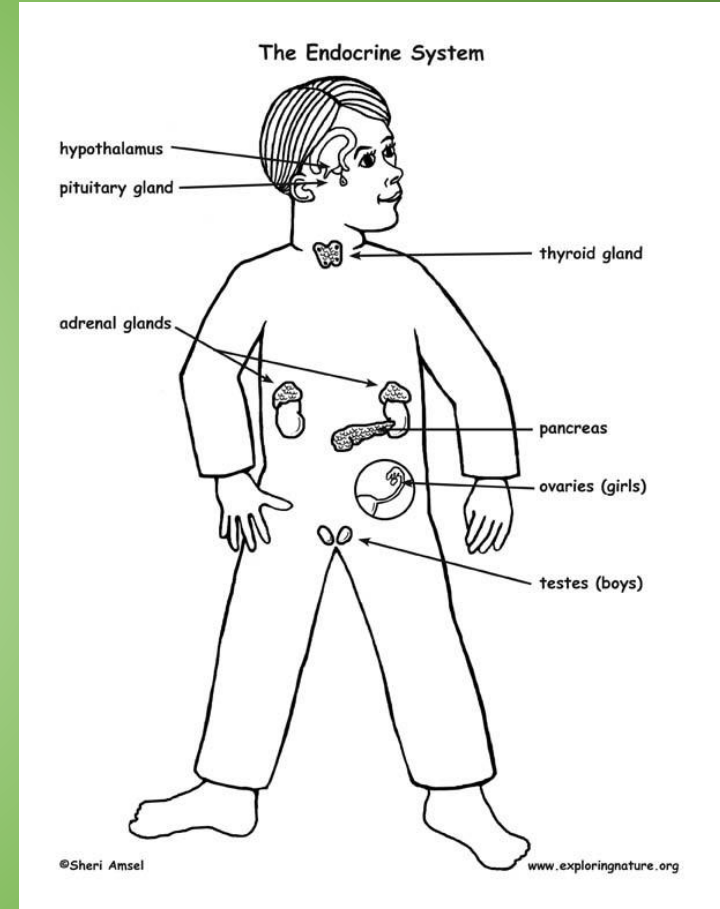
# Endocrine System

- Function:
  - Makes chemical messages that regulate conditions inside the body
  - Helps with growth and development



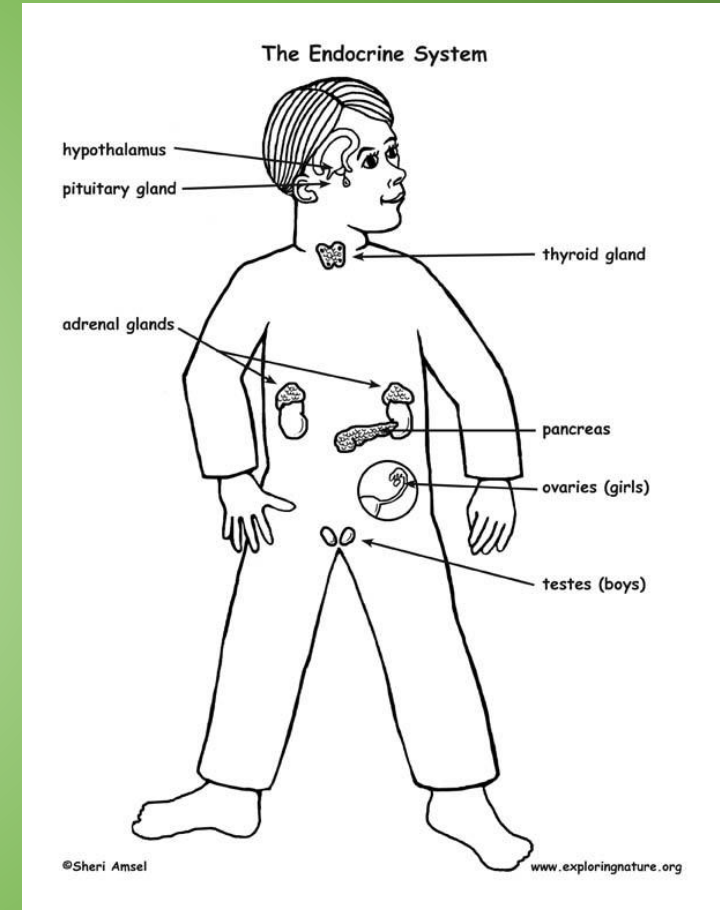
# Endocrine System

- Main Parts:
  - Hypothalamus (brain)
  - Pancreas
  - Pituitary Gland
  - Thyroid



# Endocrine System – What systems does it interact with?

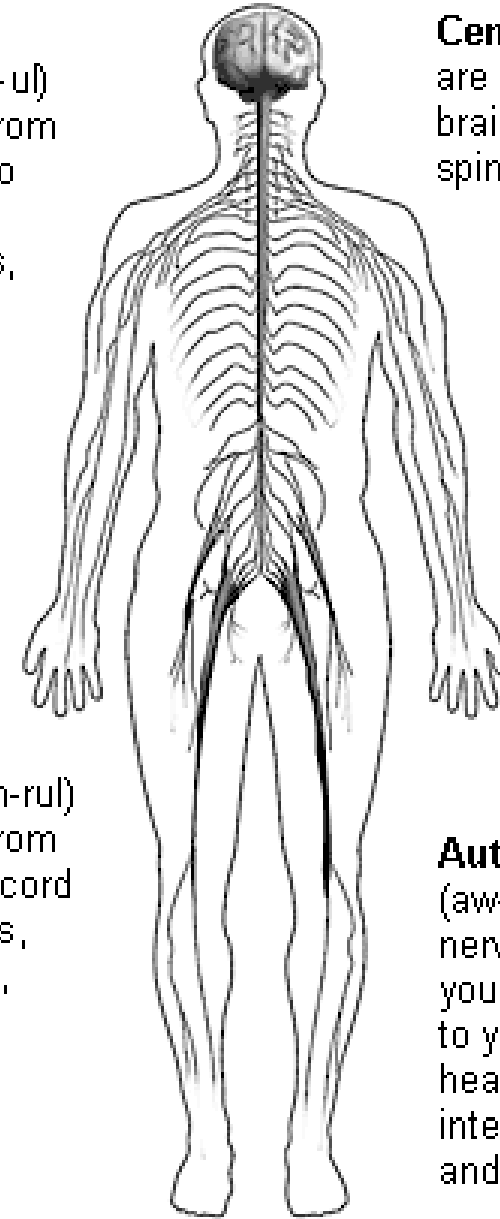
- Circulatory – takes hormones around body
- Excretory – pituitary gland controls the excretory system
- Digestive – enzymes break down food
- Skeletal – hormones control bone growth and development
- Nervous – brain tells when to start and stop producing hormones



# Nervous System

- Functions
  - Controls all body's functions
  - Senses and recognizes information from inside and outside of the body

**Cranial**  
(KRAY-nee-u)  
nerves go from  
your brain to  
your eyes,  
mouth, ears,  
and other  
parts of  
your head.



**Central** nerves  
are in your  
brain and  
spinal cord.

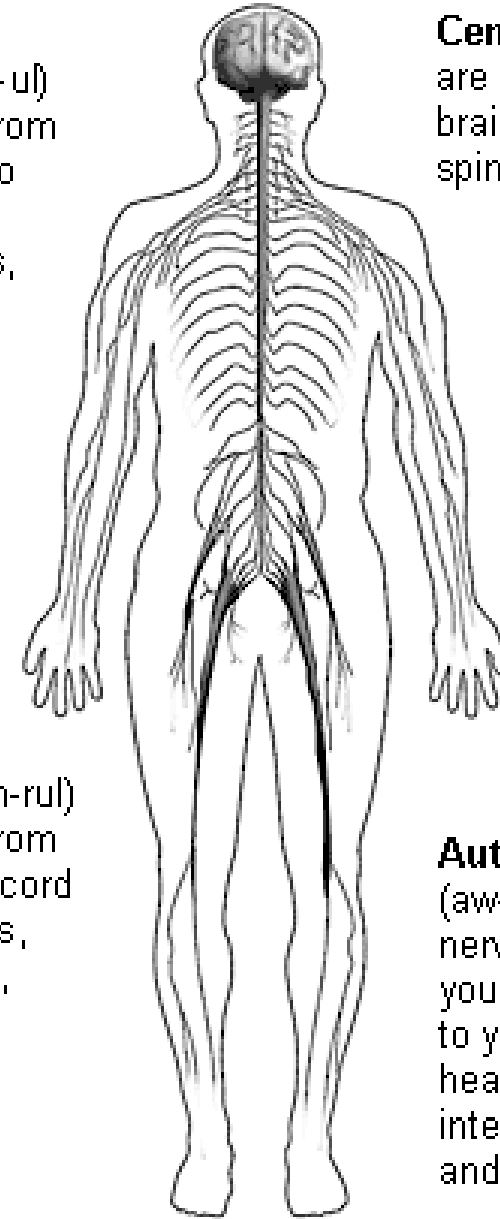
**Peripheral**  
(puh-RIF-uh-ru)  
nerves go from  
your spinal cord  
to your arms,  
hands, legs,  
and feet.

**Autonomic**  
(aw-toh-NOM-ik)  
nerves go from  
your spinal cord  
to your lungs,  
heart, stomach,  
intestines, bladder,  
and sex organs.

# Nervous System

- Main Parts
  - Brain
  - Nerves
  - Spinal cord

**Cranial**  
(KRAY-nee-u)  
nerves go from  
your brain to  
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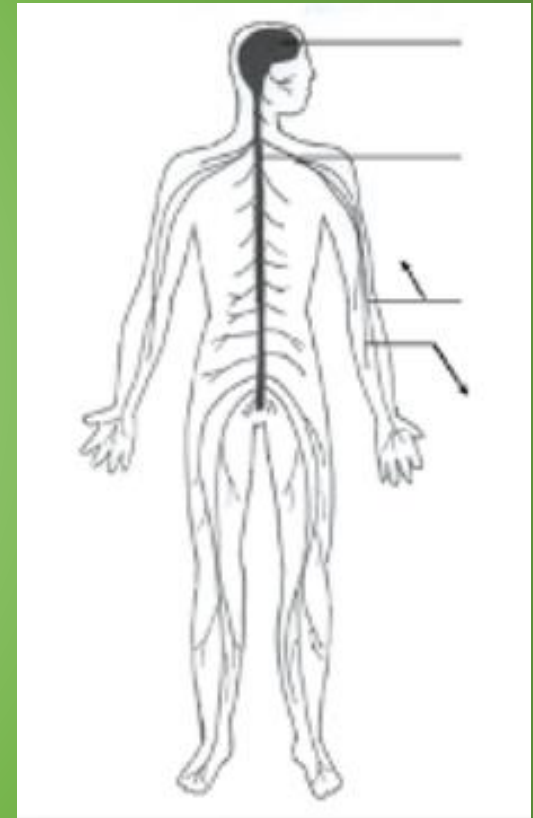
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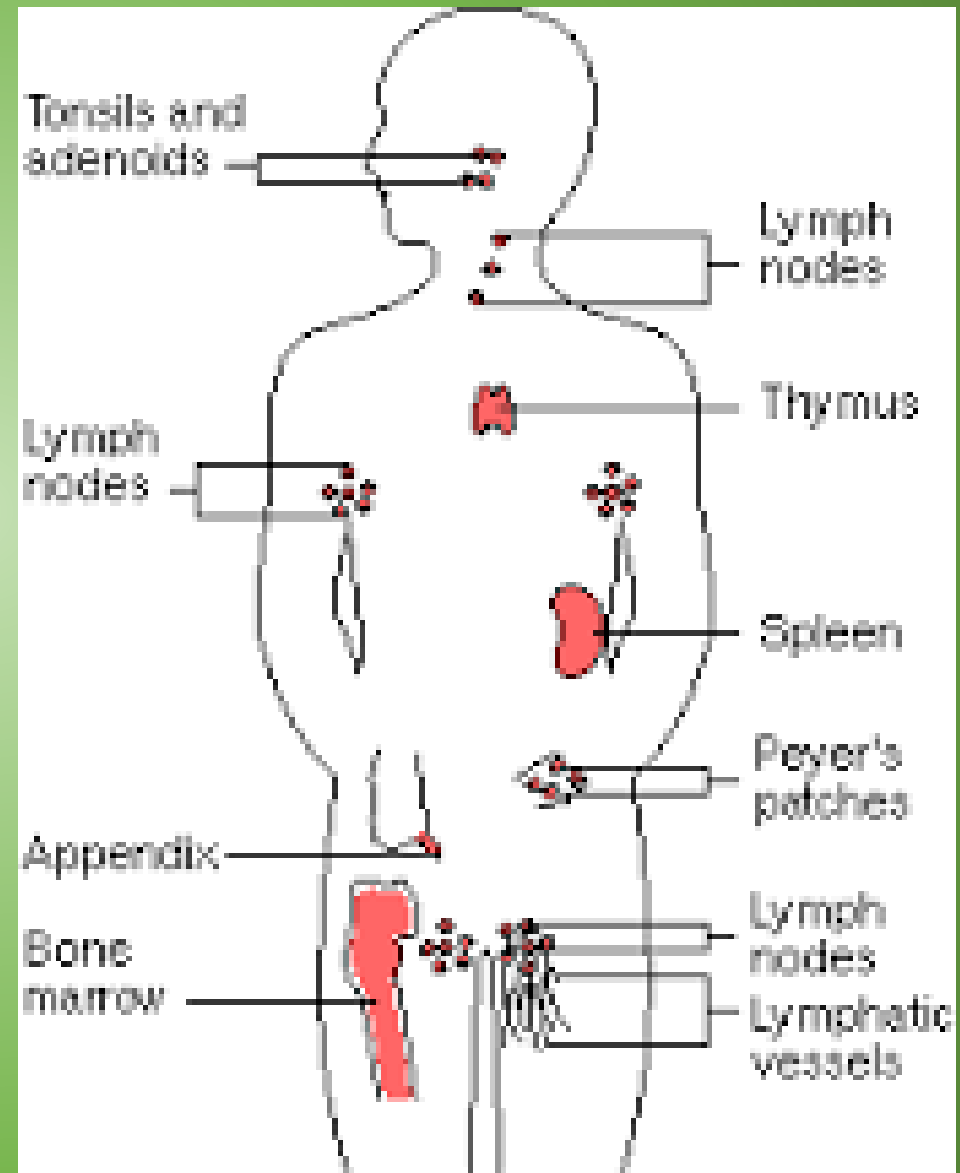
# Interactions with other systems:

- Skeletal – Bones create calcium that nervous system needs; skull/backbone protects nervous system
- Circulatory –supplies blood to brain
- All systems – Nervous system controls and regulates the other systems



# Immune System

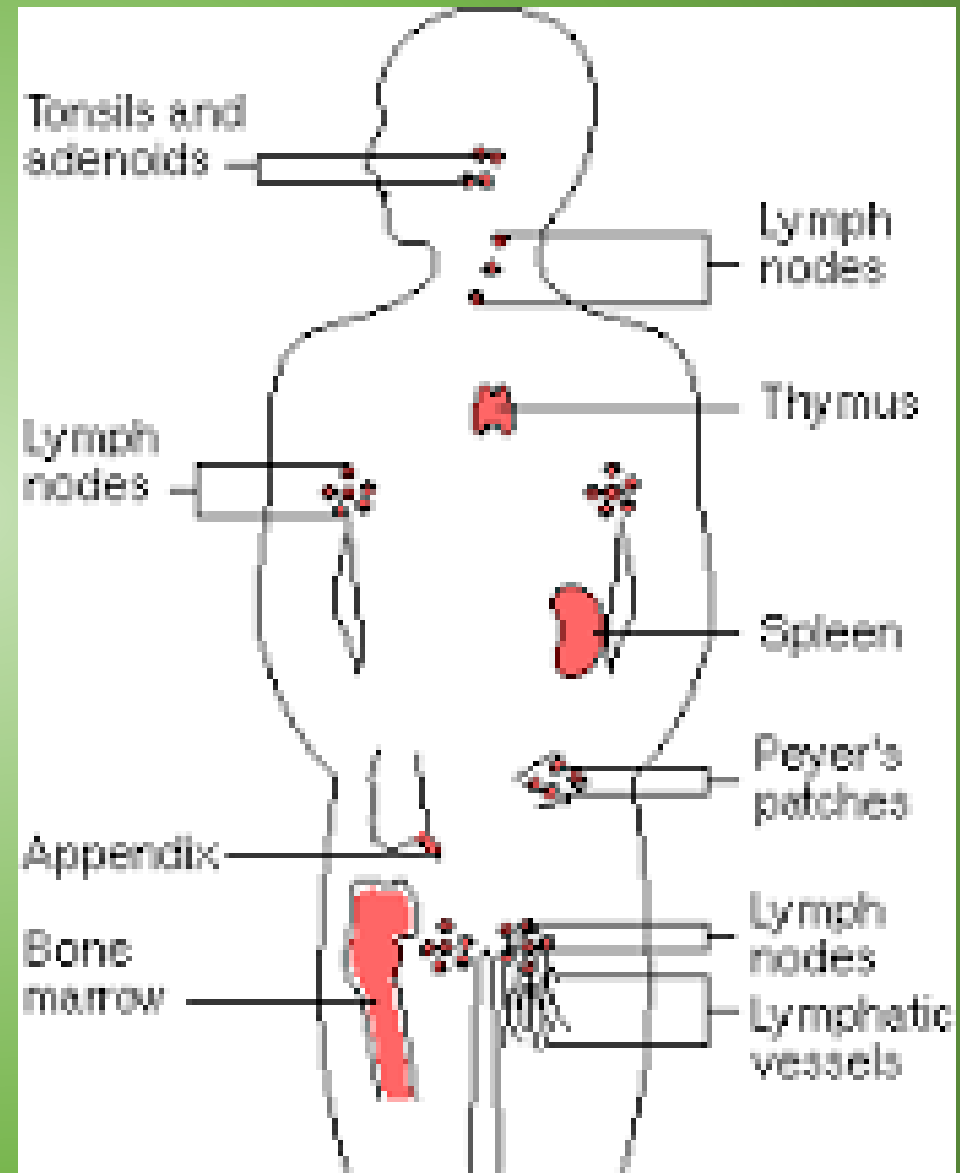
- Functions
  - Fights off disease



# Immune System

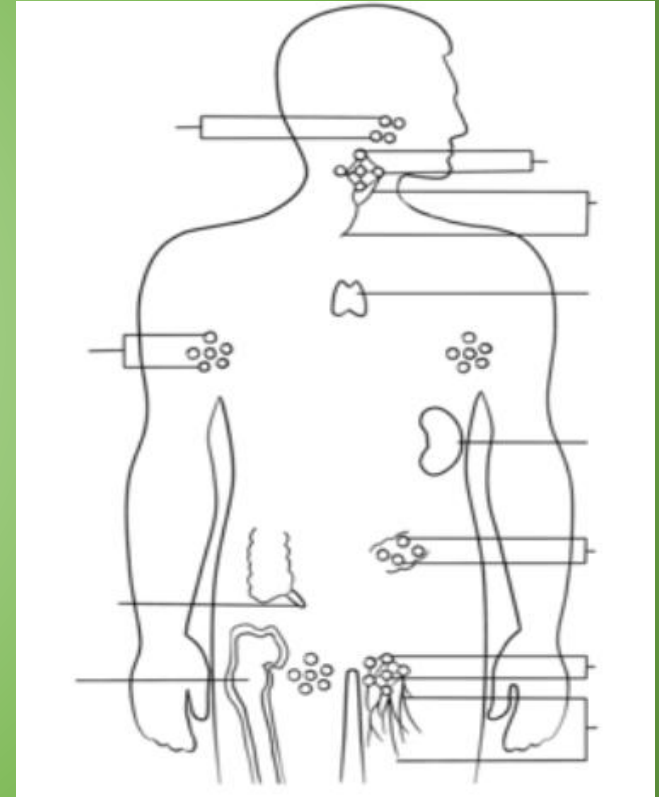
- Main Parts

- Lymph nodes
- White blood cells
- Skin
- Mucus membrane
- Bone Marrow



# Interactions with other systems:

- Circulatory –white blood cells destroy invading viruses/bacteria
- Integumentary – skin protects inside of body from invaders
- Endocrine – hormones regulate to help fight invaders



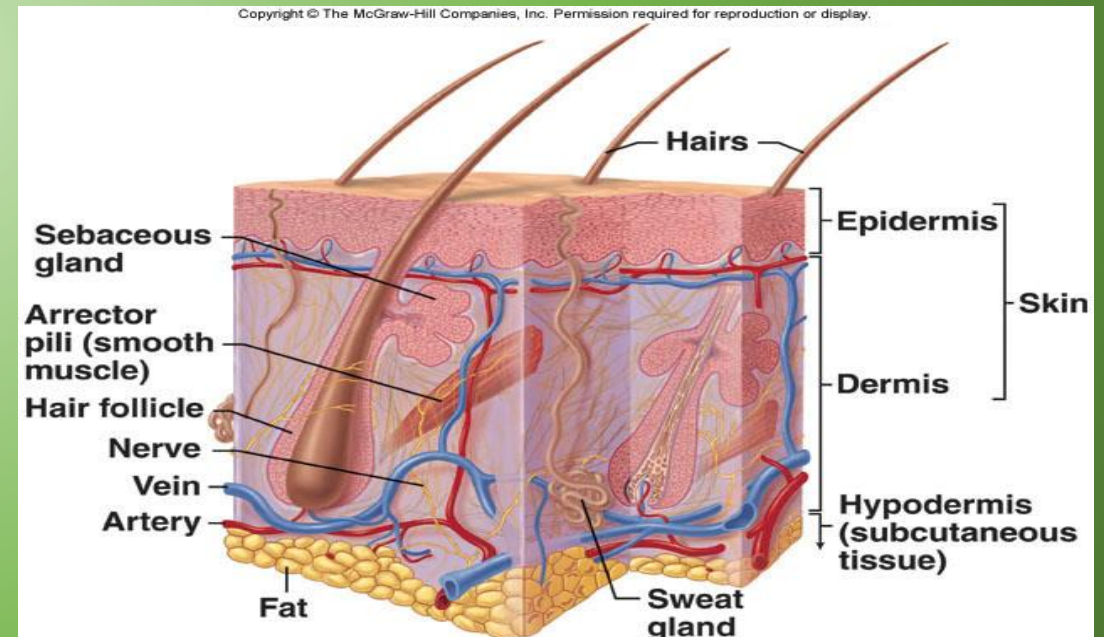
# Test Practice

When a person's body becomes infected by a virus, white blood cells in the blood produce specialized immune cells that help fight the virus, and protect the body from infections it can cause. The specialized immune cells, along with other cells, are circulated throughout the body so that the cells can reach the areas of the body that require an immune response. Which two body systems interact to protect an individual from a virus?

- A. circulatory and respiratory
- B. respiratory and nervous
- C. skeletal and immune
- D. circulatory and immune

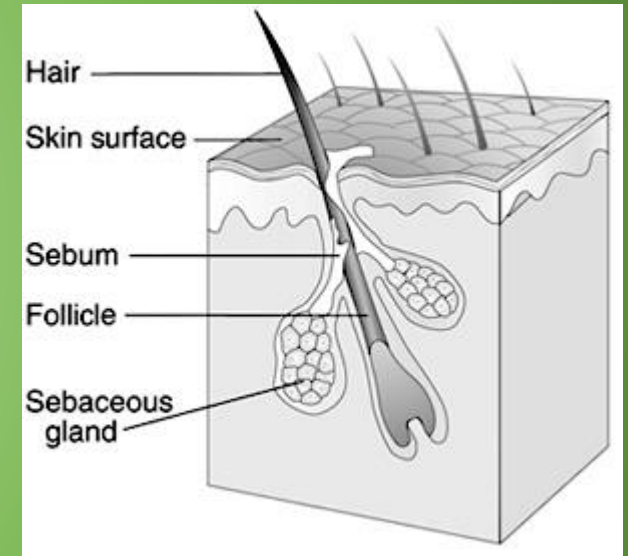
# Integumentary (Skin) System

- Function
  - 1<sup>st</sup> line of defense against disease
  - Helps maintain body temperature
  - Keeps fluids inside
- Main Parts
  - Skin
  - Sweat glands
  - Hair
  - nails



# Interactions with other systems...

- Excretory – removes cellular waste (sweat)
- Immune – first line of defense
- Circulatory – capillaries expand and contract to control body temperature
- Nervous – sends information to the brain, nervous regulates the blood flow to the skin



# Test Practice

In many multicellular organisms, organ systems interact in order to achieve a stable internal environment within the organism. Match the organ systems below with the function that they work together to perform.

nervous and muscular

digestive and circulatory

digestive and excretory

respiratory and circulatory

## Interrelated Function

## Organ Systems

processing and responding to sensory information



taking in gases and moving them through the body



taking in nutrients and moving them through the body



processing nutrients and expelling wastes from the body





# Test Practice

The levels of organizations in multicellular organisms are shown below, but they are not in the correct order. Arrange the levels of organization in order from simplest to most complex.

