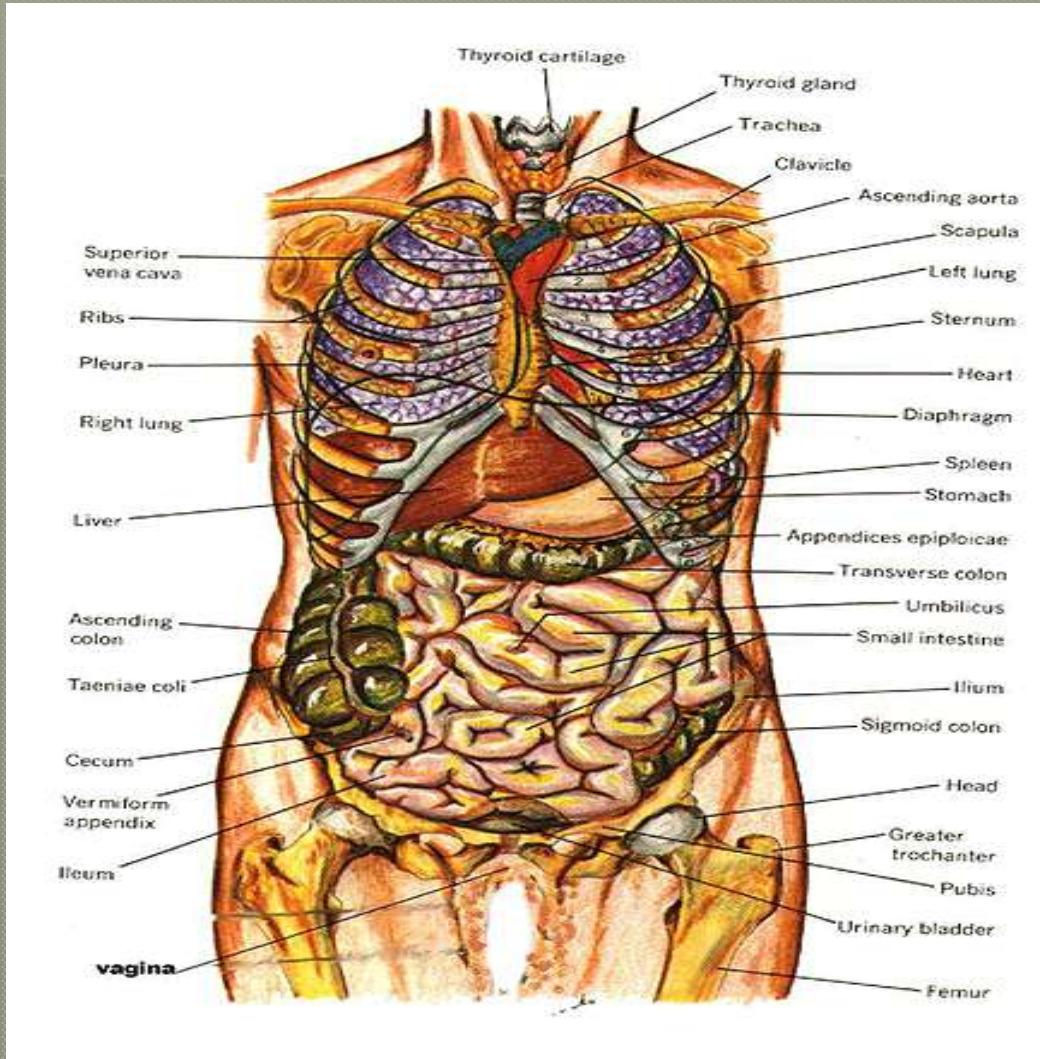
The Human Body



What is an ORGAN SYSTEM?

- A group of organs working together to perform a certain function is an ORGAN SYSTEM!

The Skeletal System

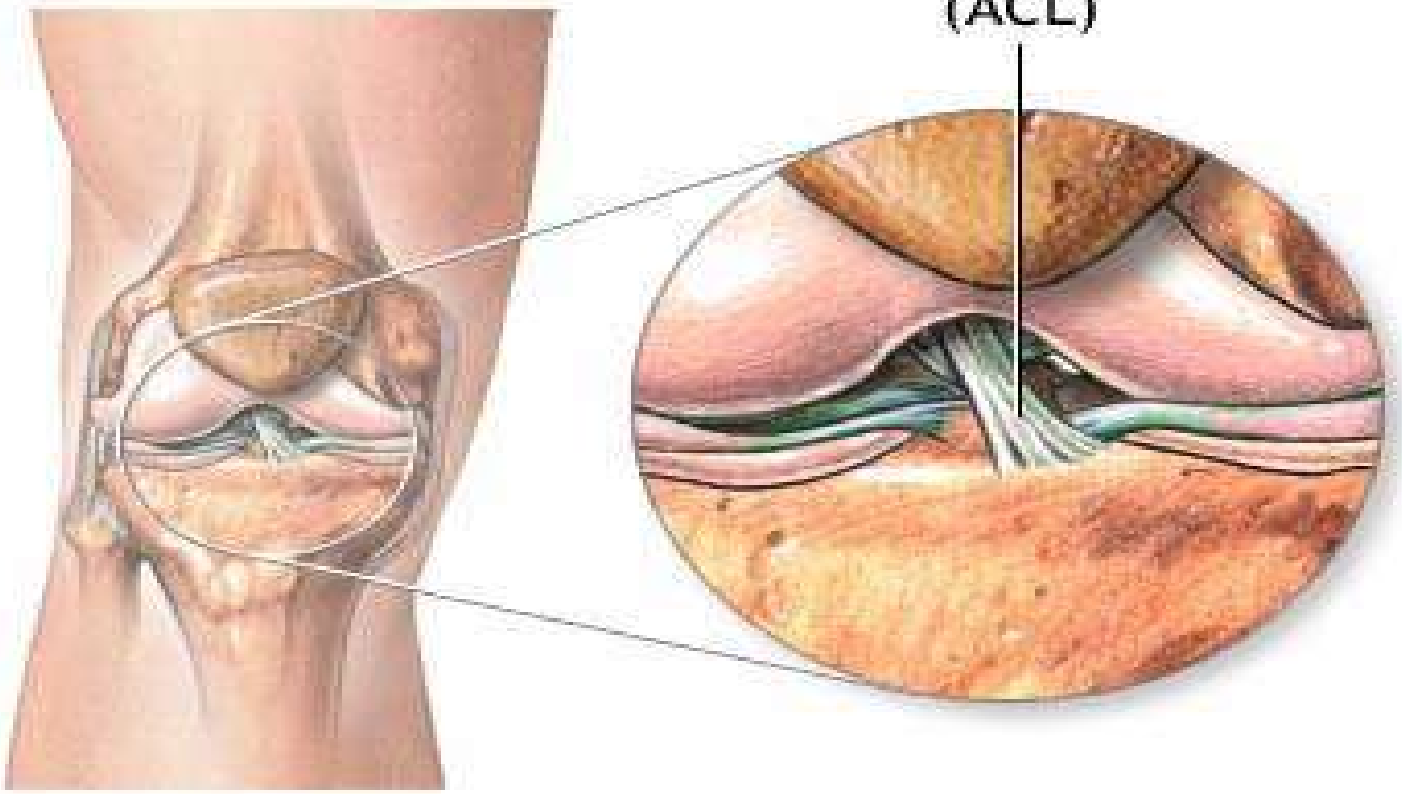
- What does it do?
  - Gives your body its shape and supports your body.
  - Protects your internal organs.
  - Major muscles are attached to bones to help them move.
  - Blood cells are formed in the center of many bones in their soft tissue called MARROW.
  - Large amounts of the minerals calcium and phosphorus are stored in the skeleton for later use.

The Skeletal System

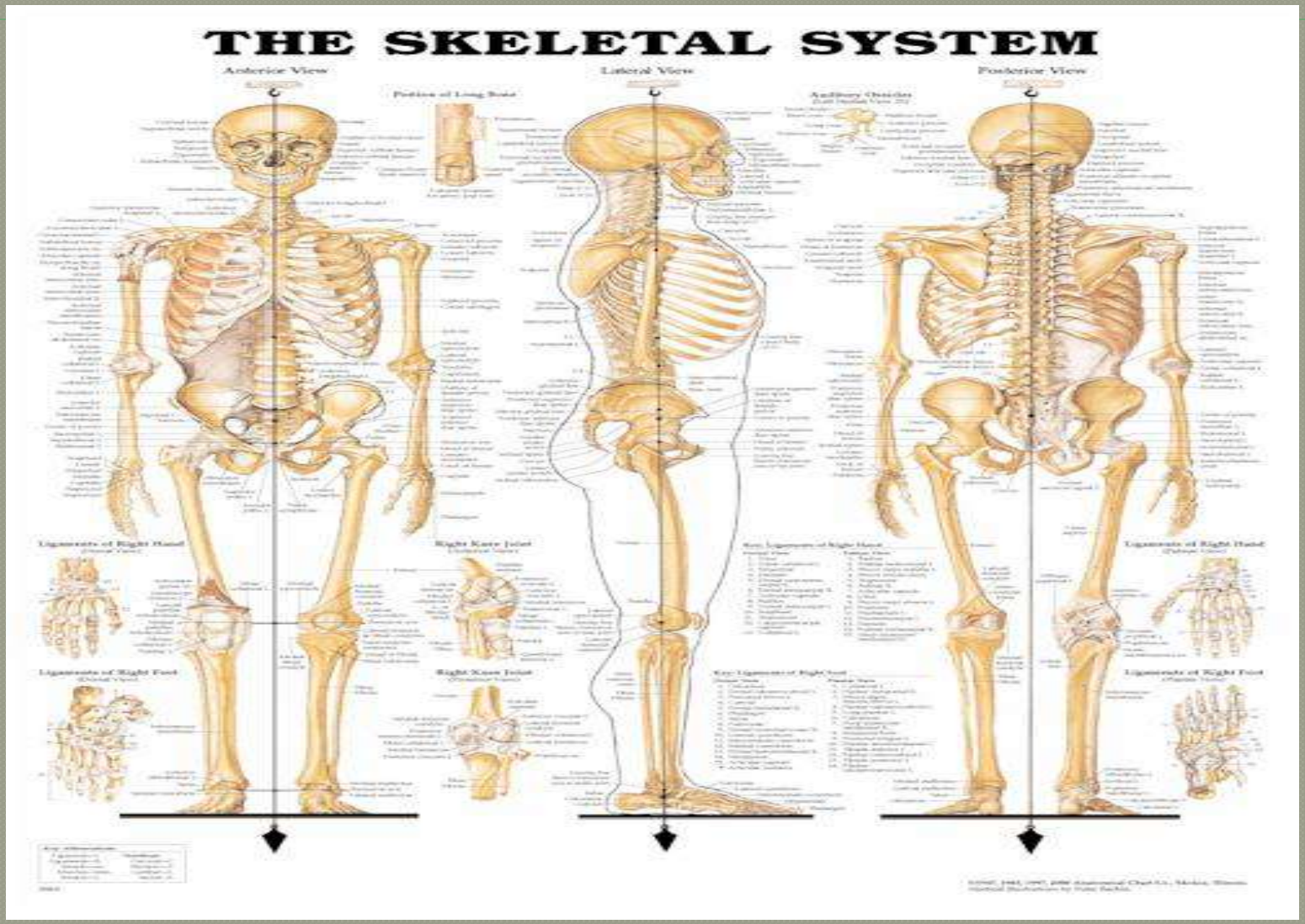
- What tissue/organs are part of the skeletal system?
  - 206 Bones
  - Bone Marrow (makes blood cells)
  - Ligaments (hold bones together)

- Bone cells make up bone tissue, which makes up bones, which make up the skeletal system.

Ligaments



What does the Skeletal System look like?



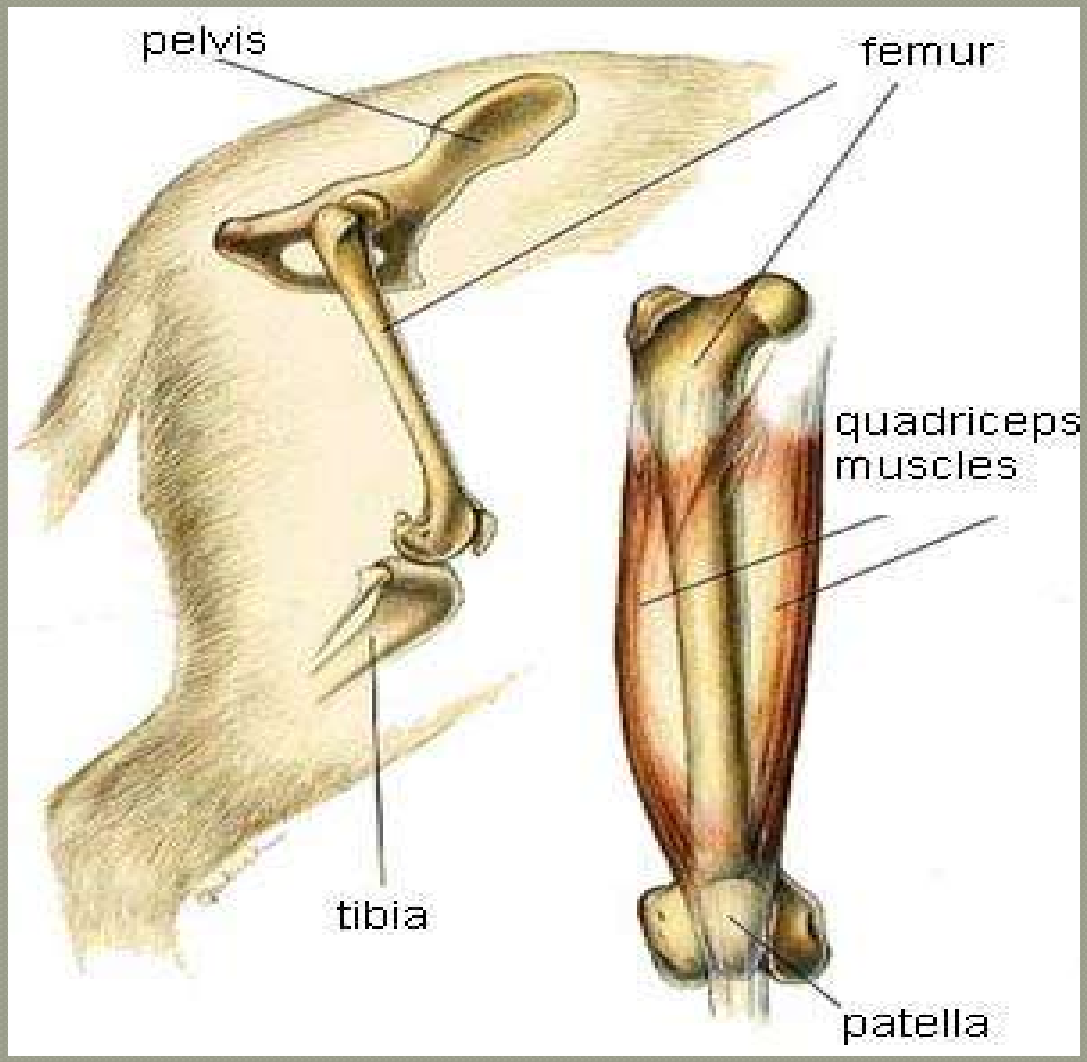
The Muscular System

- What does it do?
  - Produces movement

    - Blood vessels carry energy-rich molecules to the muscle cells where the energy is stored and released.
  - Provides stability

  - Generates heat
    - Releases thermal energy

work together to produce movement

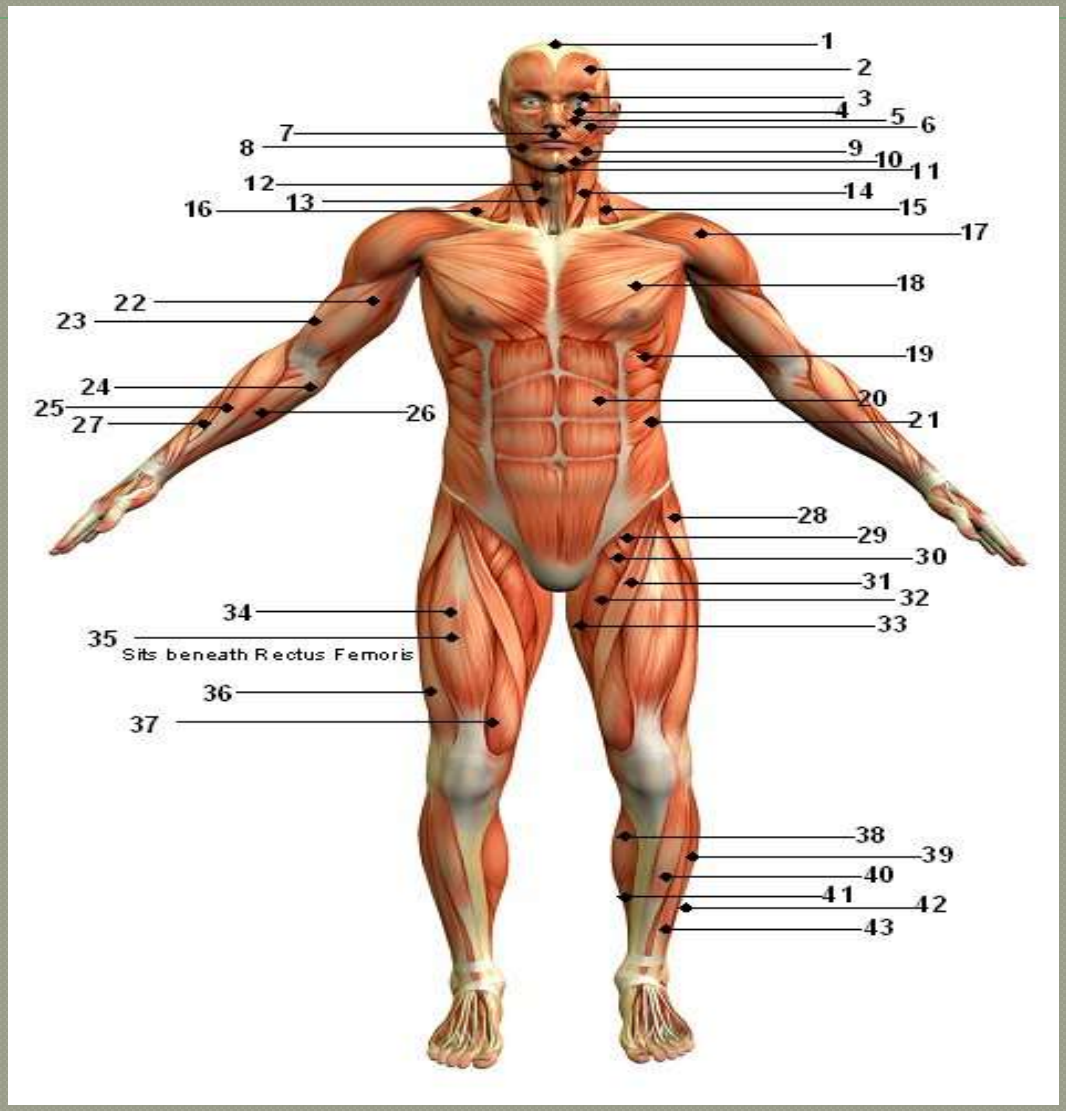


Muscles provide stability

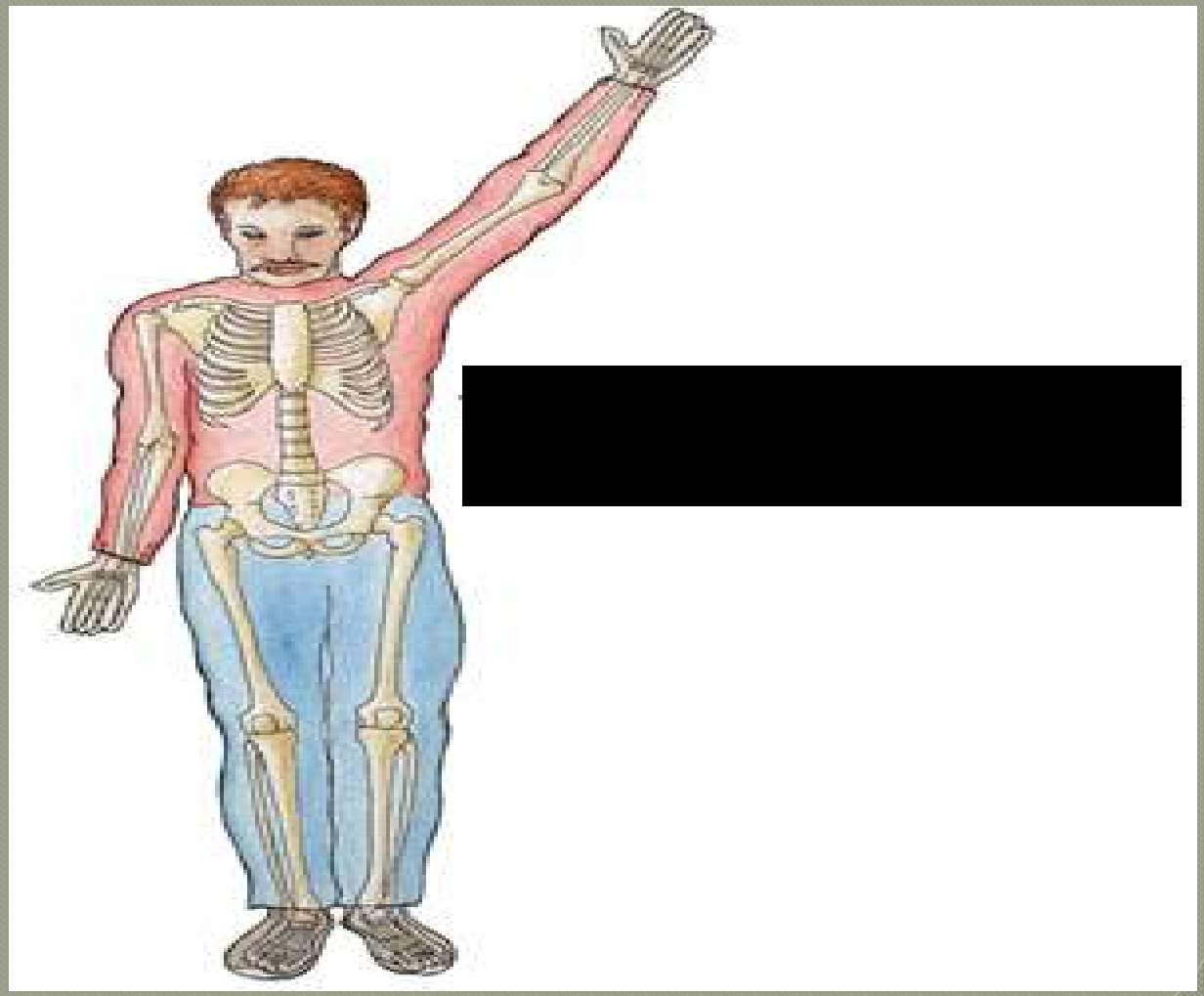
The Muscular System

- What tissue/organs are part of the muscular system?
  - 3 Types of Muscles
  1. Cardiac
     - Heart muscle
  2. Smooth
     - Involuntary (Digestive System muscles)
  3. Skeletal
     - Attached to bones

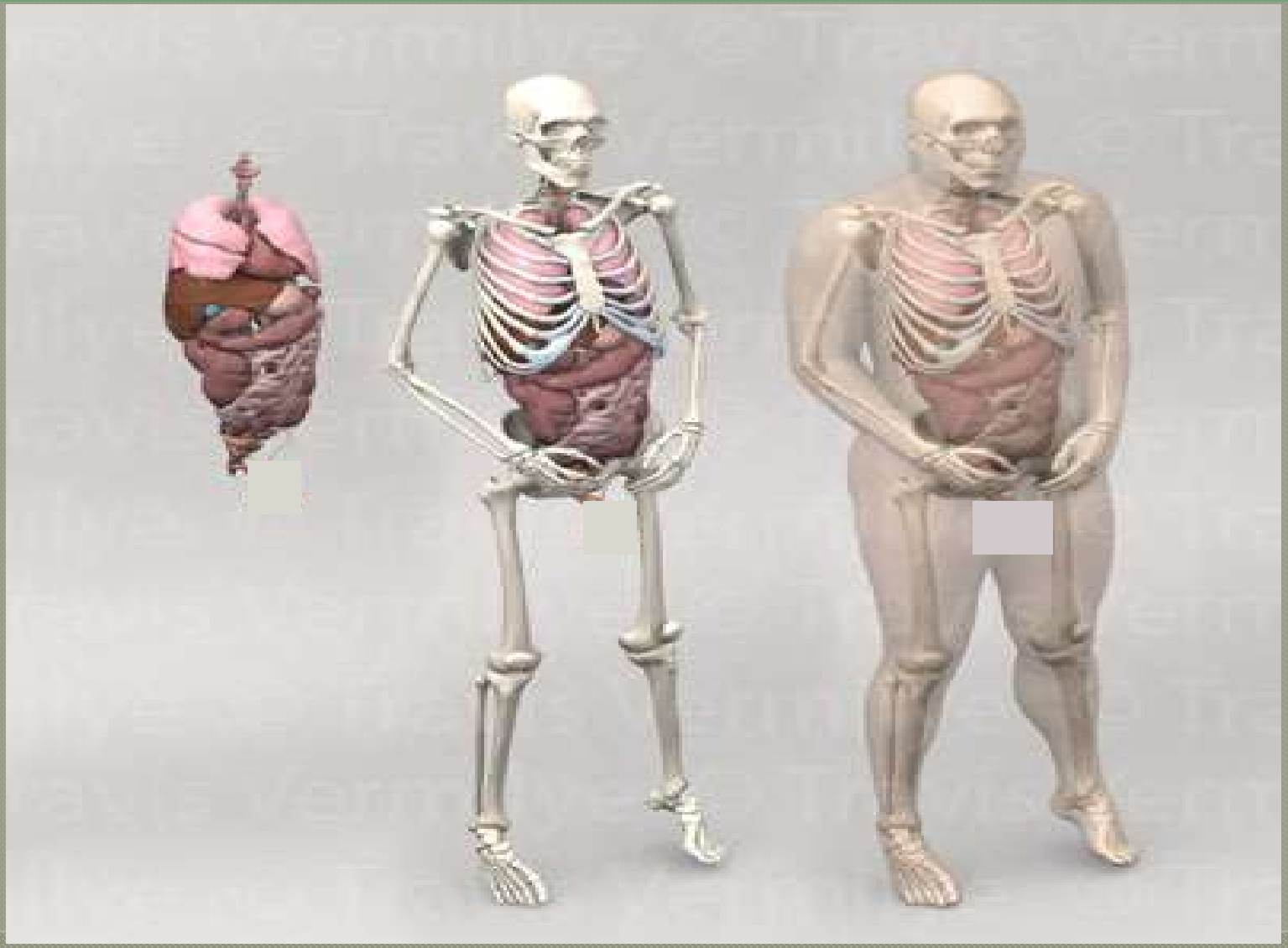
What does the Muscular System look like?



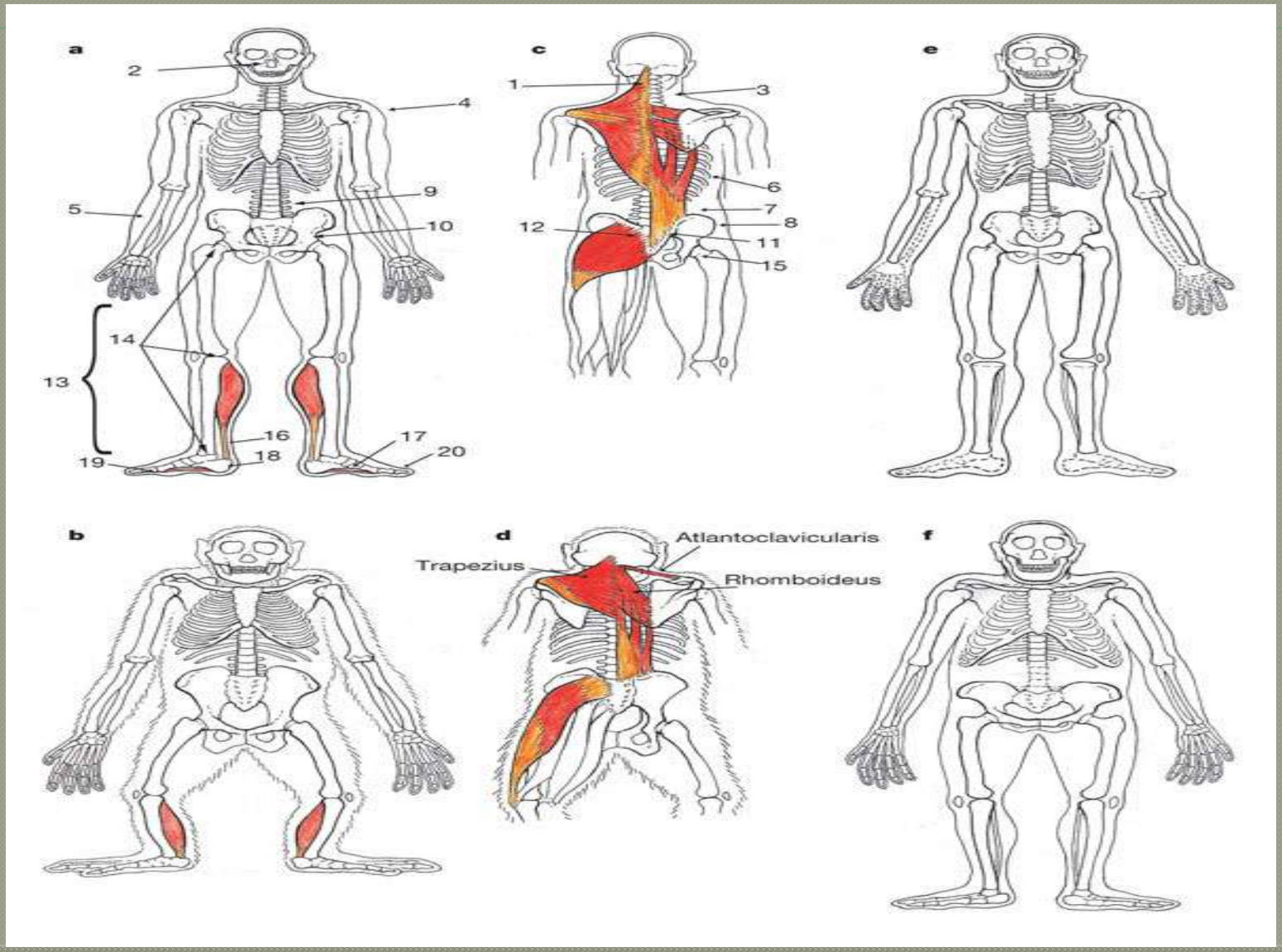
Shapes the Body



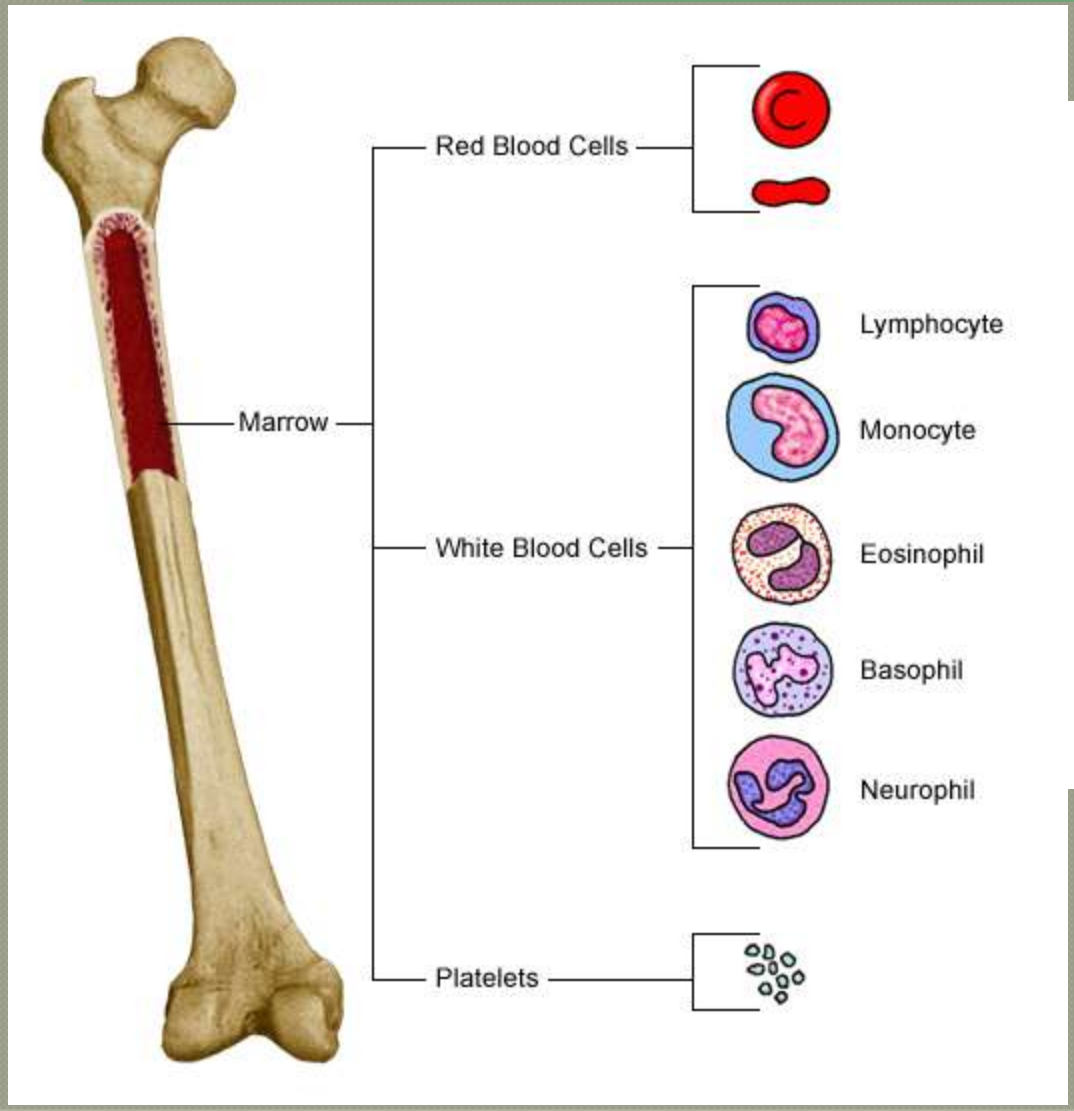
Protects Internal Organs

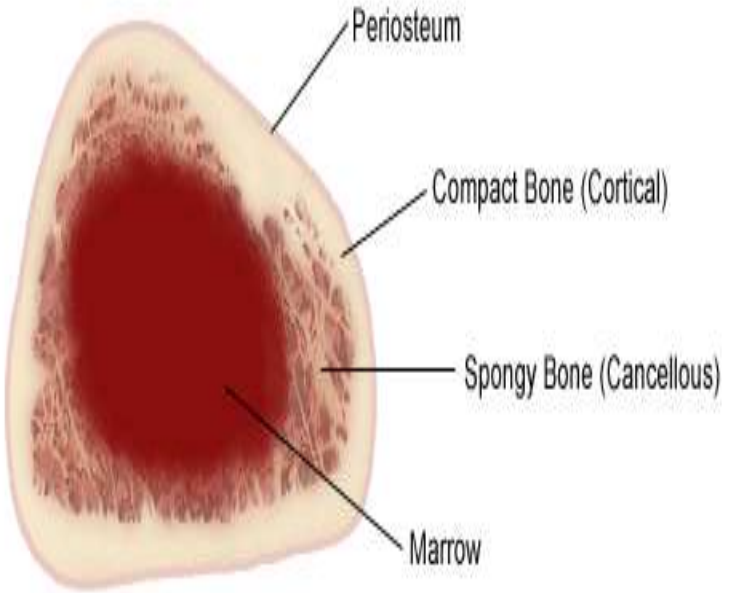


Muscles are Attached to Bones



Blood Cells are formed in the bone's marrow





Bone contains the minerals calcium and phosphorus

SKIN

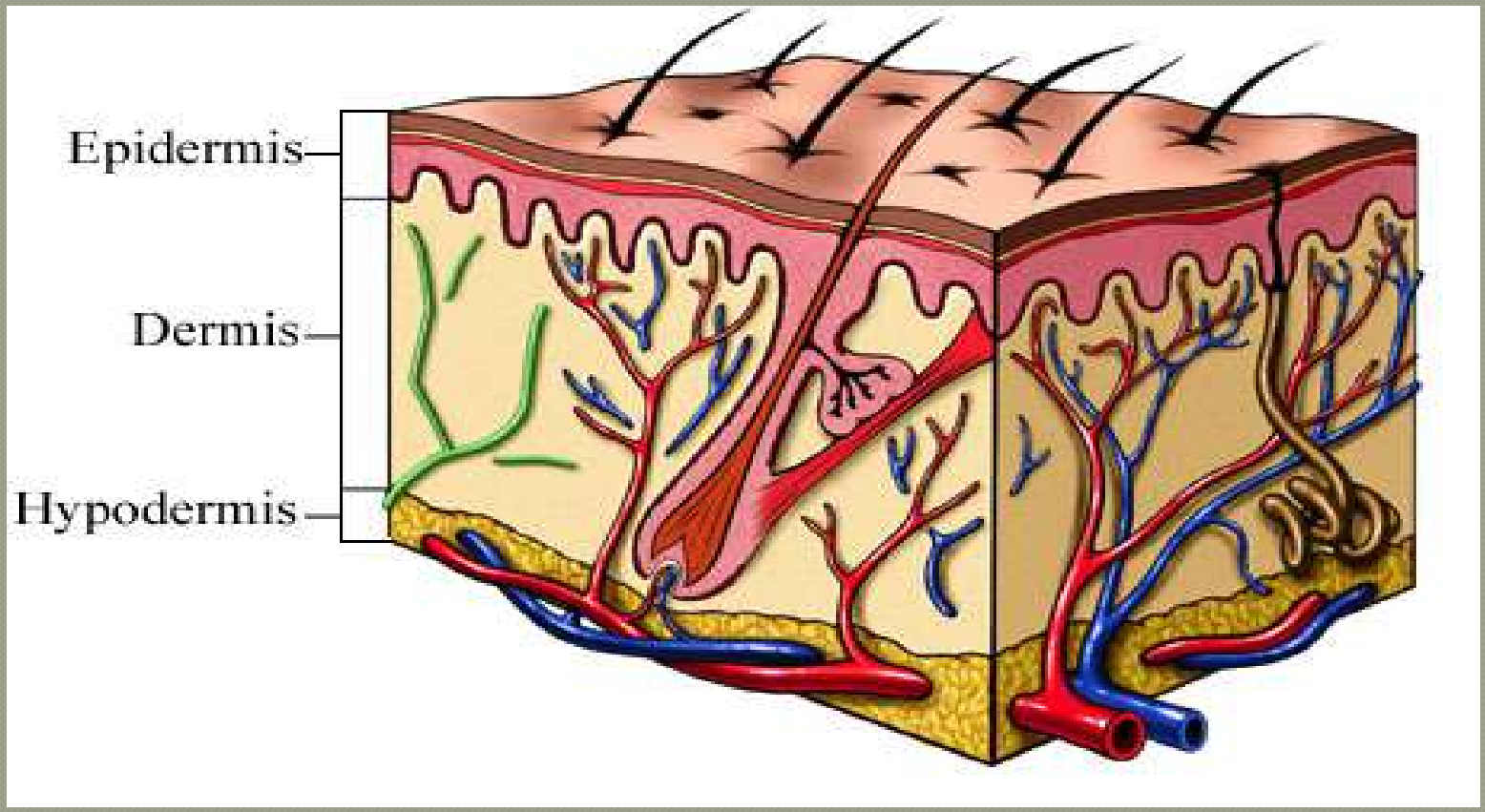
- What does it do?
  - Largest organ of the human body
  - Protects the body from physical and chemical injury
  - Slows down water loss from the body's tissue
  - Nerve cells in the skin allows you to sense touch
  - Produces Vitamin D to help your body absorb calcium from your digestive tract
  - Regulates body temperature

SKIN

- What are the structures of the skin?
  - 3 Layers of Tissue
    1. Epidermis- outer, thinnest layer of skin; water-repellant
       - Produces the chemical MELANIN which gives the skin its color
    2. Dermis- contains blood vessels, nerves, muscles, oil and sweat glands, and other structures
    3. Fatty Layer- insulates the body

SKIN

- What does it look like?



DIGESTIVE SYSTEM

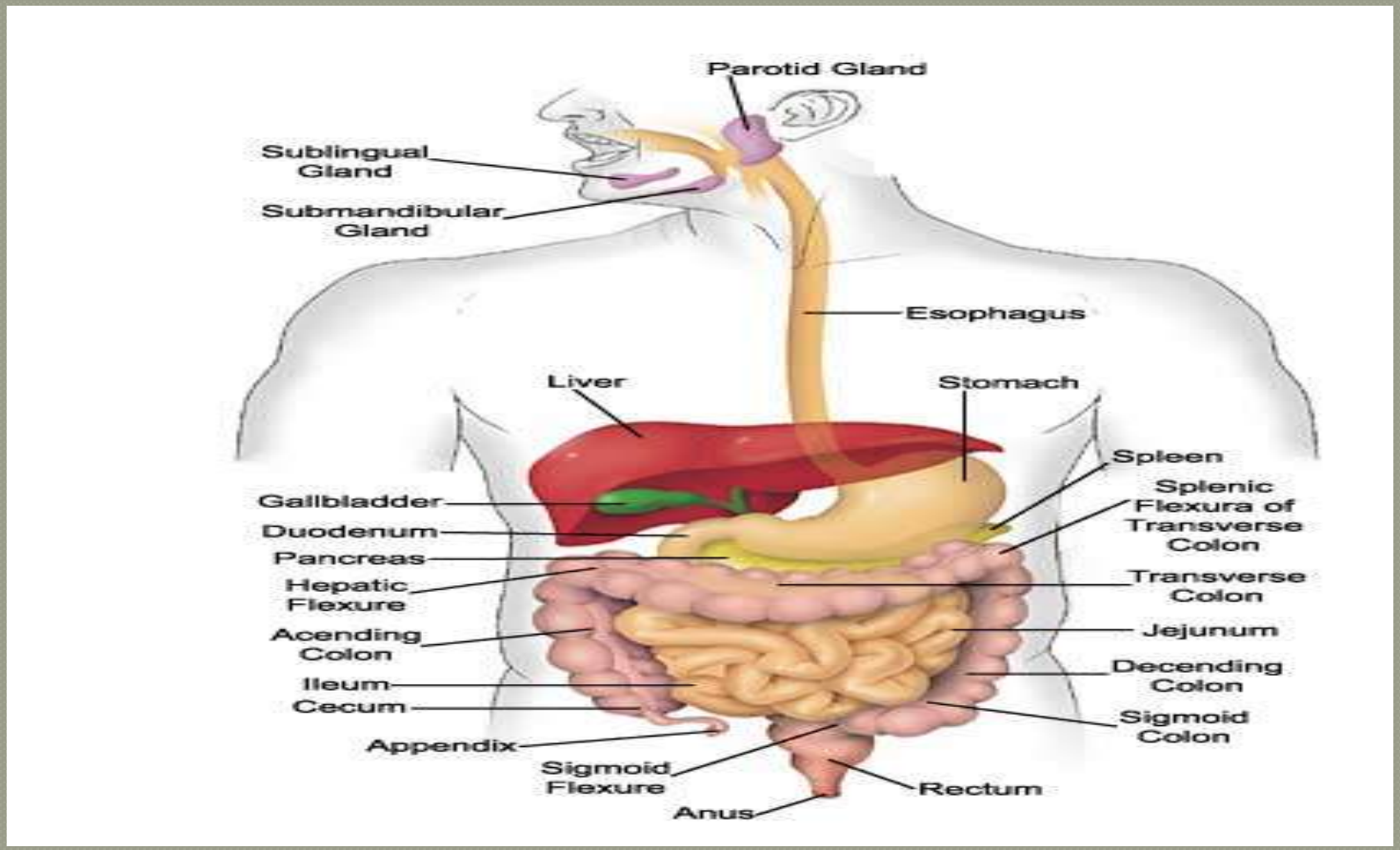
- What does it do?
  - Food is processed in your body in 4 stages:
    1. Ingestion- food enters your mouth
    2. Digestion- breakdown of food
       - Mechanical digestion- chewing food
       - Chemical digestion- chemicals break down large molecules of food into smaller molecules of food.
         - ENZYMES- protein that speeds up chemical digestion
    3. Absorption- food is absorbed and moved into the blood
    4. Elimination- needed food enters the cells through the cell membrane and what is not needed passes out of the body as waste.

DIGESTIVE SYSTEM

- What are the parts of the digestive system?
  - **Digestive Tract**
    - Mouth- mechanical and chemical digestion
    - Esophagus
    - Stomach- mechanical and chemical digestion
    - Small Intestine
    - Large Intestine
    - Rectum
    - Anus
  - **Accessory Organs**
    - Tongue
    - Teeth
    - Salivary glands
    - Liver- produce and store enzymes
    - Gallbladder- produce and store enzymes
    - Pancreas- produce and store enzymes

DIGESTIVE SYSTEM

- What does it look like?



CIRCULATORY SYSTEM

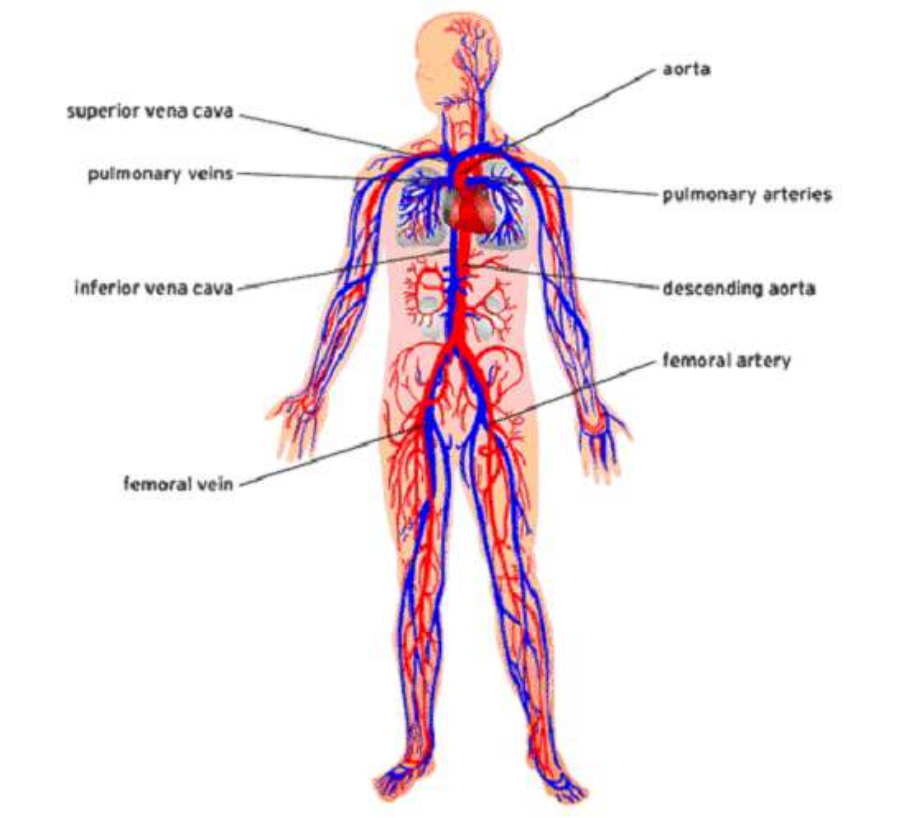
- What does it do?
  - Helps respiration by delivering oxygen to the cells and removing carbon dioxide from them
  - Carries digested food substances to the cells of the body
  - Helps dispose of waste products and poisons that would harm the body if they built up (carbon dioxide, salts, ammonia)
  - Helps protect the body from disease with white blood cells
  - Regulates body temperature with blood flow
  - Carries hormones
  - Materials move through diffusion and active transport

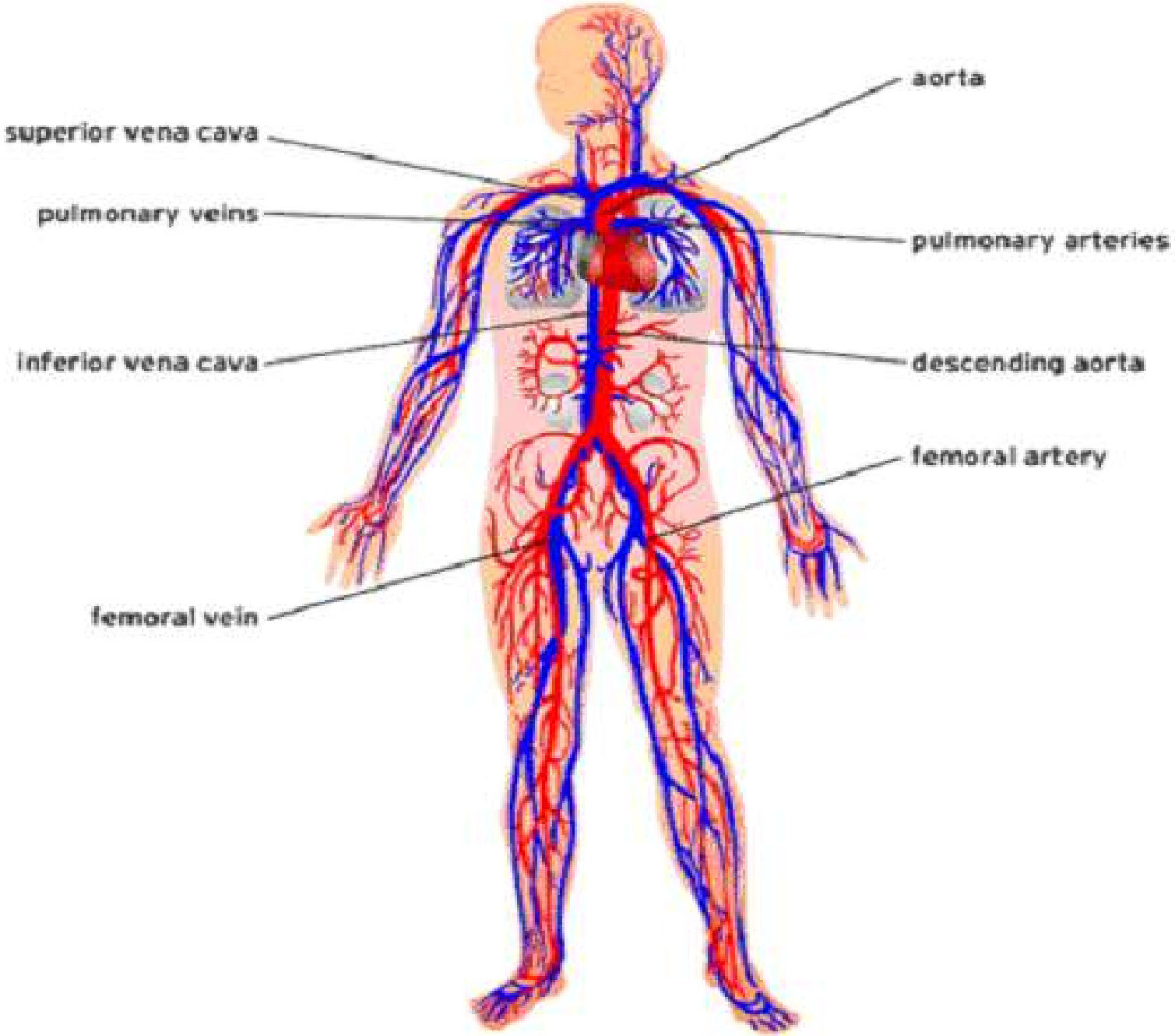
CIRCULATORY SYSTEM

- What organs/tissues are part of it?
  - Heart
    - Made of cardiac muscle tissue
  - Vessels
    - Arteries- carry blood away from heart
    - Veins-carry blood to heart
    - Capillaries- connect arteries and veins
  - Blood
    - Coronary Circulation-flow of blood to and from tissues of the heart
    - Pulmonary Circulation-flow of blood from heart to lungs and back to heart
    - Systemic Circulation- blood flows to all organs and body tissues except the heart and lungs

CIRCULATORY SYSTEM

- What does it look like?




aorta
superior vena cava
pulmonary veins
pulmonary arteries
inferior vena cava
descending aorta
femoral artery
femoral vein

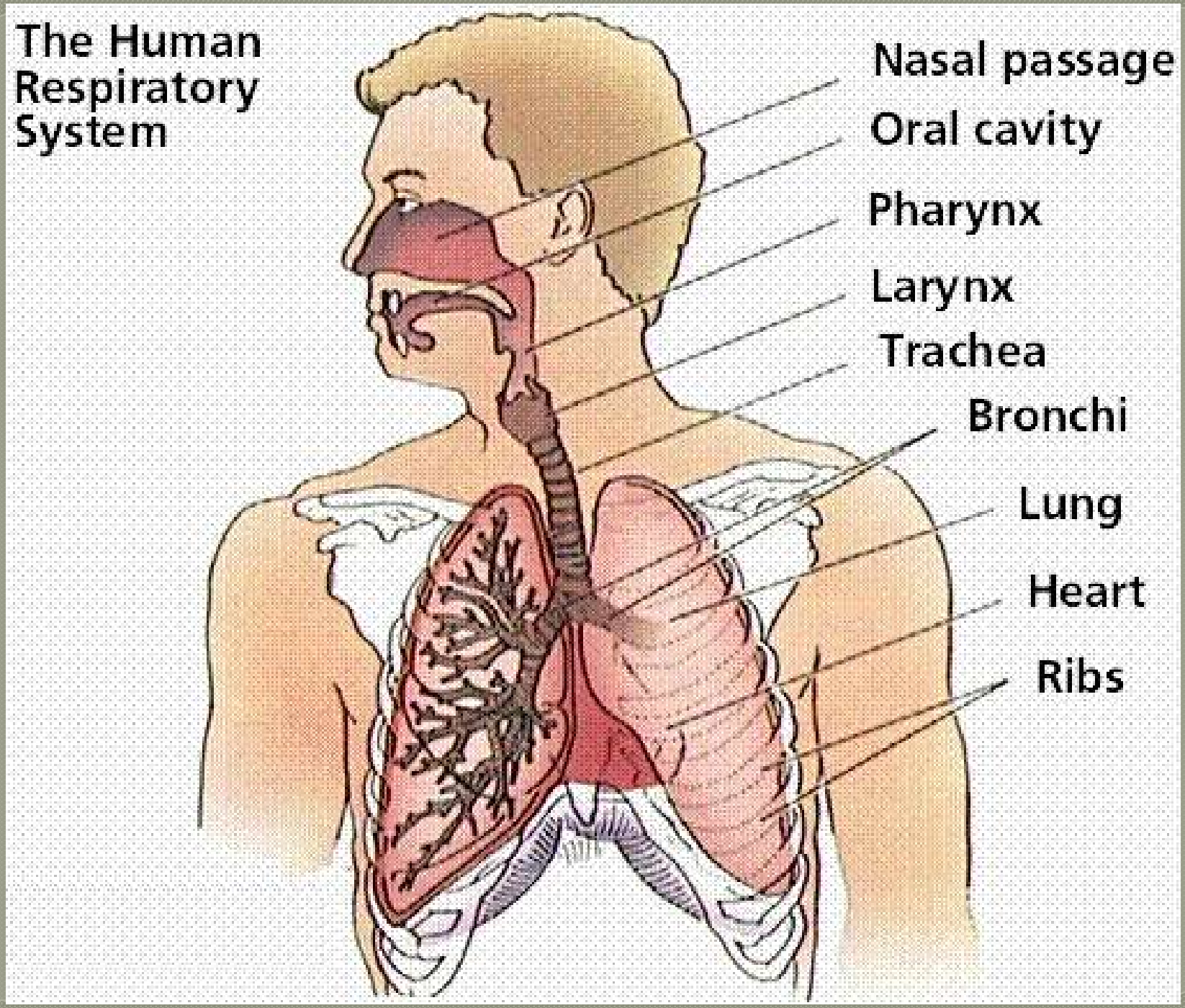
RESPIRATORY SYSTEM

- What does it do?
  - Breathing- movement of the chest that brings air into the lungs and removes waste gases out of the lungs
  - Respiration- chemical reaction where blood carries oxygen to cells and digestive system sends glucose (sugars) to the cells which allow cells to release energy, carbon dioxide, and water back into blood so blood can carry them to the lungs and out of the body by exhaling.

RESPIRATORY SYSTEM

- What tissues/organs are part of it?
  - Pharynx- air enters here after entering mouth and nose and nasal cavity
  - Larynx- air enters here from pharynx; vocal cords are attached here
  - Trachea- air enters here from larynx; lined with small hairs called cilia
  - Bronchi- carry air into the lungs
  - Lungs- filled with air-filled sacs called alveoli.
  - Diaphragm- muscle beneath the lungs that contracts and relaxes to move gases in and out of the body

The Human Respiratory System



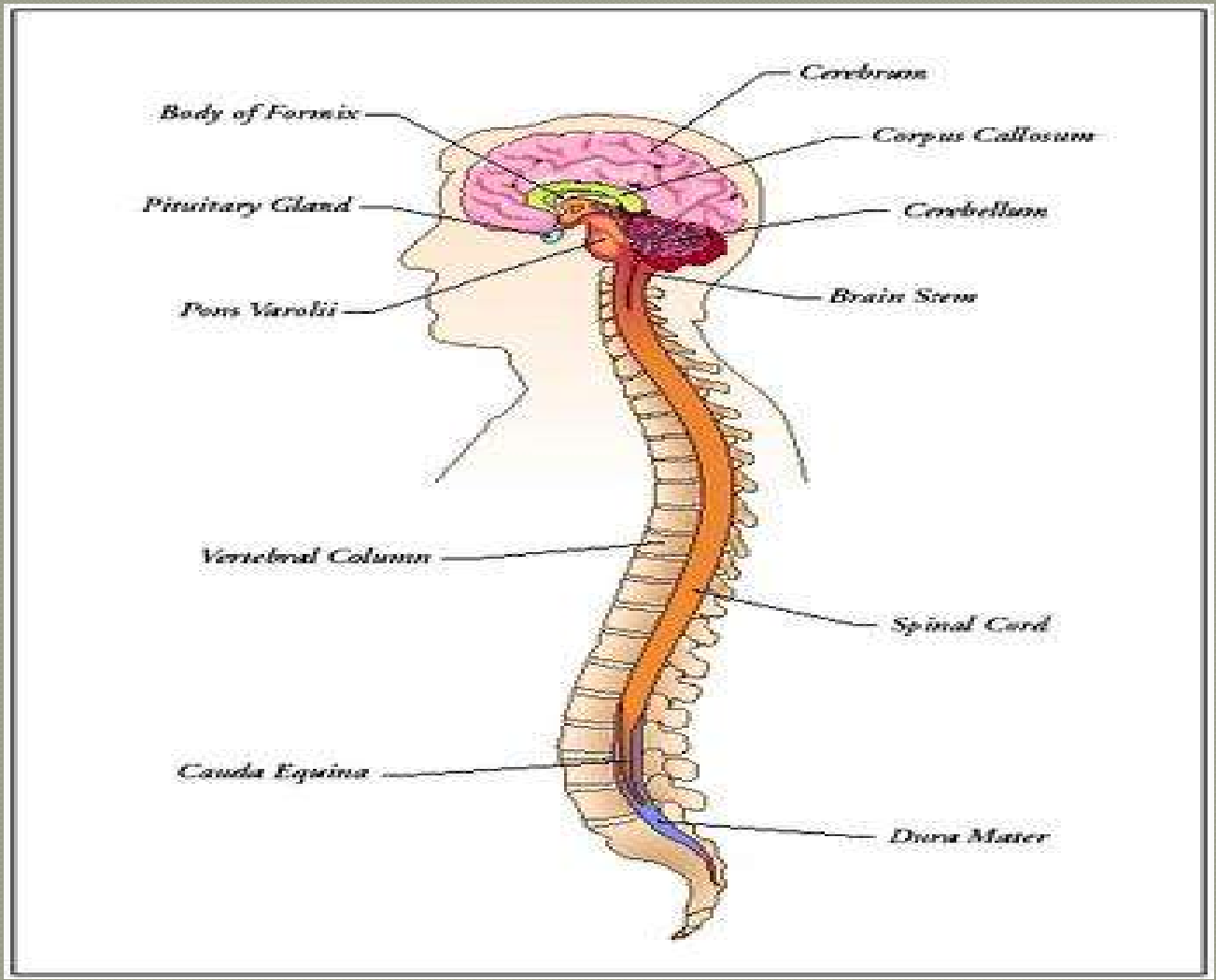
Nervous System

- What does it do?
  - Control and coordinate the other systems
  - Allows your body to adjust to changing stimuli
    - Stimuli- any external or internal change that brings about a response
      - Noise, light, smell, temperature are external stimuli
      - Chemical substances such as hormones are internal stimuli
  - Homeostasis- regulation of steady, life-maintaining conditions inside an organism
    - Examples: regulation of breathing, heartbeat, digestion

Nervous System

- What tissue/organs are part of it?
  - Nerves- nerve cells called Neurons
    - Made up of a cell body and branches called dendrites.
  - Brain
    - Cerebrum (thinking)
    - Cerebellum (coordination)
    - Brain Stem (controls involuntary actions like heartbeat and breathing)
  - Spinal Cord

What does it look like?



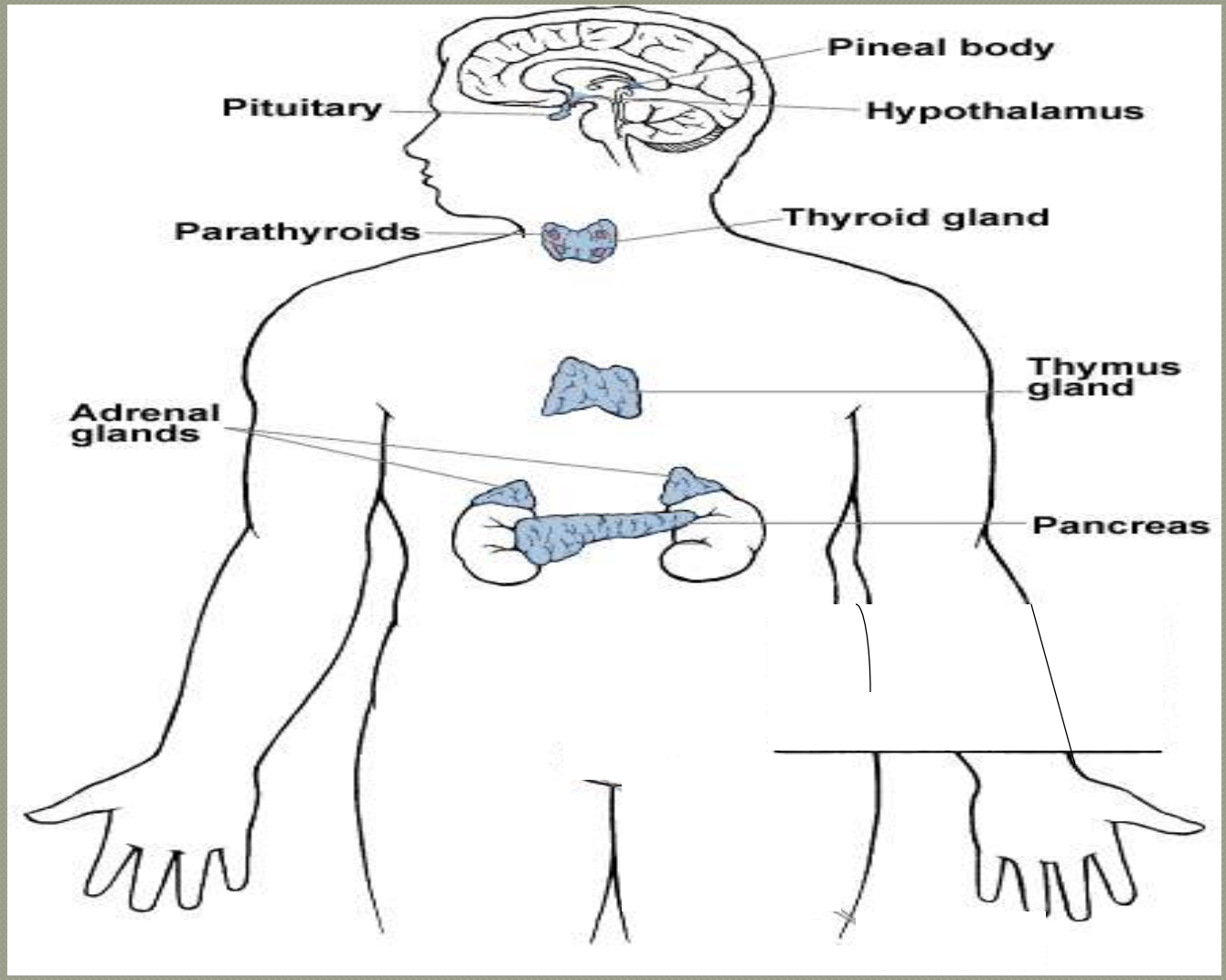
Endocrine System

- What does it do?
  - Control system
  - Sends messages throughout the body using hormones
    - Hormones- chemical produced by the endocrine system that is released into the bloodstream by glands and affect target tissues
  - The body does not react as quickly from messages from the endocrine system as it does from messages from the nervous system

Endocrine System

- What tissue/organs are part of it?
  - Glands- release hormones directly into the bloodstream
    - Pineal (sleep)
    - Pituitary (growth and reproduction)
    - Thymus (fight infection)
    - Thyroid (metabolism, calcium for bones, nervous system development)
    - Adrenal (stabilize blood sugar levels)
    - Ovaries (reproduction-female)
    - Testes (reproduction-male)

What does it look like?



Reproductive System

- What does it do?
  - Allow the body to reproduce and continue life
  - Works with the endocrine system

Reproductive System

- What tissues/organs are part of it?
  - Sperm
  - Eggs

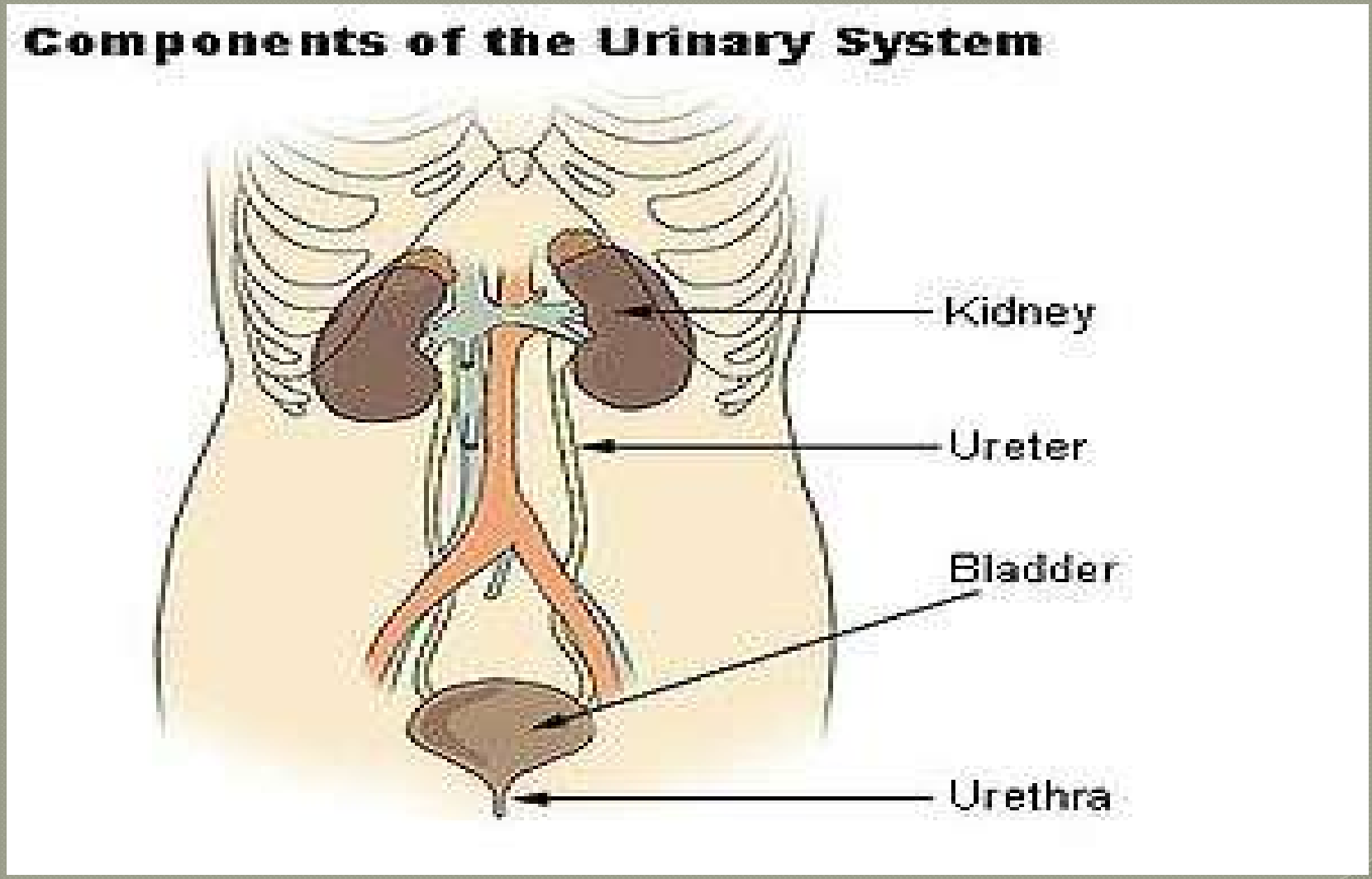
Excretory System

- What does it do?
  - Eliminates waste from your body
  - Urinary system is part of the excretory system and controls blood volume by removing excess water produced by the body cells
  - Regulates fluid levels in the body
  - Kidneys filter blood that contains wastes collected from the cells
  - In 5 minutes, all blood from your body is filtered by your kidneys!

Excretory System

- What tissue/organs are part of it?
  - Kidneys- 2 bean-shaped organs that filter blood, producing urine.
  - Ureters- tubes that lead from each kidney to the bladder
  - Bladder- elastic, muscular organ that holds urine until it leaves the body.
  - Urethra- carries urine from the bladder to outside the body.
  - Liver- also filters blood to remove waste

What does it look like?



Immune System

- What does it do?
  - Defends your body from disease-causing organisms
  - First-Line Defense:
    - Skin, respiratory, digestive, and circulatory systems are the first line of defense
    - Skin: outer barrier
    - Respiratory: traps pathogens with cilia and mucus
    - Digestive: saliva, enzymes, and mucus kill bacteria
    - Circulatory: contains white blood cells that surround and digest foreign organisms and chemicals.

Immune System

- What tissues/organs are part of it?
  - Lymph Nodes- filter out foreign materials
    - When your body fights an infection, lymphocytes fill the lymph nodes to destroy invaders
  - Thymus- makes lymphocytes
  - White Blood Cells- surround and digest foreign organisms and chemicals
  - Spleen- removes worn out and damaged red blood cells
  - Tonsils- protect you from harmful microorganisms that enter through your mouth and nose

What does it look like?