

Chapter 1 & 2 Notes

Lesson 1.1: Body Organization

How is your body organized?

Cells → tissues → organs → organ systems → organism

CELL: the basic unit of structure and function in a living thing.

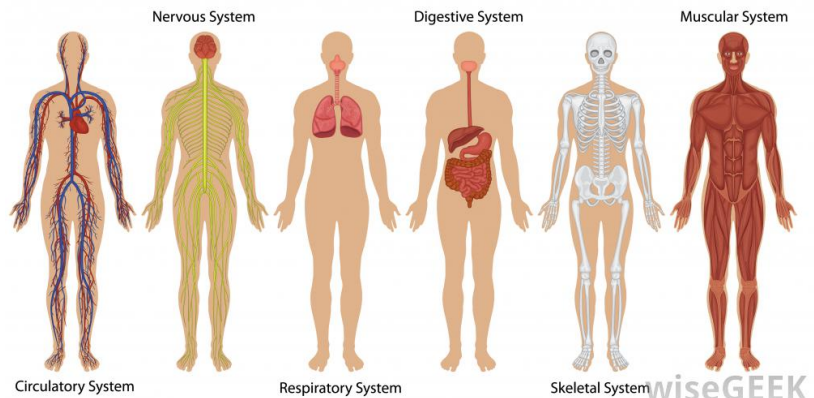
- CELL MEMBRANE: forms the outside border of the cell
- NUCLEUS: directs the cell's activities and holds the information that controls a cell's function.
- CYTOPLASM: clear, jelly-like substance that contains many cell structures.

TISSUE: a group of similar cells that perform the same function.

- MUSCLE TISSUE: makes parts of your body move by contracting and shortening.
- NERVOUS TISSUE: directs and controls body processes by sending electrical messages back and forth between the brain and other parts of the body.
- CONNECTIVE TISSUE: provides support for your body and connects all of its parts
 - Example: Bone tissue and fat tissue
- EPITHELIAL TISSUE: covers the surfaces of your body, inside and out.
 - Example: Skin

ORGAN: a structure that is made of different kinds of tissue and performs a specific job.

ORGAN SYSTEM: a group of organs that work together, carrying out major functions.



Lesson 1.2: System

Interactions

How do you move?

SKELETON: all the bones in your body.

* Muscles and bones work together, making your body move. The nervous system tells your muscles when to act *

SKELETAL MUSCLES: attached to the bones of your skeleton and provide the force that moves your bones.

- Muscles contract and relax, pulling on the bones they are attached to.

JOINT: a place in the body where two bones come together.

- A place where the skeleton bends.

Which systems move materials in your body?

* The circulatory, respiratory, digestive, and excretory systems play key roles in moving materials in your body. *

- Circulatory system (heart, blood vessels, and blood) transports materials like water, oxygen and food to all cells and gets rid of wastes like carbon dioxide and other
- Respiratory system brings in oxygen and releases carbon dioxide.
 - Works together with CIRCULATORY SYSTEM to transport oxygen and carbon dioxide through the body using the blood stream.
- Digestive system helps break down food into sugars and other nutrients your body can use.
 - NUTRIENT: a substance that you get from food and that your body needs to carry out processes.
 - ABSORPTION: nutrients move from the digestive system into the bloodstream. (like a sponge)
- Excretory system eliminates waste from your body

Name: _____

Block: _____

- All other systems play a part in this.

Which Systems Control Body Functions?

* The nervous system and the endocrine system work together to control body function. *

- Nervous system (brain, spinal cord, and nerves) controls and directs body activities.
 - 5 senses bring information into nervous system and trigger reactions.
 - STIMULUS: a signal that makes you react
 - RESPONSE: what your body does in reaction to a stimulus
- Endocrine system sends chemical messages to control and direct body activities
 - GLANDS: organs of the endocrine system that release chemical signals directly into the bloodstream.
 - HORMONES: chemical signals released by endocrine system.

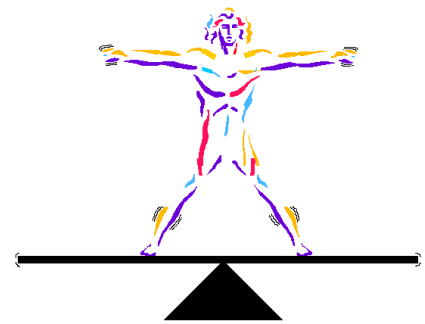
Lesson 1.3: Homeostasis

HOMEOSTASIS: the condition in which an organism's internal environment is kept stable in spite of changes in the outside environment.

- Keeping a balance is necessary for survival

* All of your body systems work together to maintain homeostasis and keep the body in balance. *

- Regulating temperature
 - When cold → shiver
 - When warm → sweat
 - Keeps internal temperature the same → 98.6°
 - Changes in blood flow to skin can prevent heat loss or carry heat away.
- Meeting Energy Needs
 - If you need more energy → endocrine & nervous system signal digestive system
- Maintaining Water Balance
 - If you need more water → feel thirsty
- Keeping Your Balance
 - Inner ears send information to brain about position of head.
 - If losing balance, message from brain to muscles to steady yourself.
- Responding to Stress
 - STRESS: the reaction of your body to possibly threatening, challenging, or uncomfortable events.
- Fighting Disease
 - When body systems are balanced = HEALTHY
 - Bacteria and viruses can disrupt homeostasis and make you sick.
 - Immune system helps to bring back balance of body systems.



Lesson 2.1: The Skeletal System

What does the skeleton do?

SKELETON: made up of all the bones in your body... the framework that supports you.

Has 5 major functions:

- 1) Shape
- 2) Support
- 3) Allows movement

Name: _____

Block: _____

- 4) Protects organs
- 5) Produces blood cells and stores minerals

VERTEBRAE: 26 small bones that make up the backbone or vertebral column.

What role do joints play?

JOINT: a place where 2 bones come together.

* Joints allow bones to move in different ways. *

2 kinds of joints in the body:

- 1) Immovable joints: connect bones together but allow for little or no movement/
 - a. Example: Bones of the skull
- 2) Movable joints: allow the body to make many different movements.
 - a. **LIGAMENTS:** strong connective tissue that holds joints together.
 - b. 4 types of movable joints:
 - i. Ball-and-socket joint: Hip
 - ii. Pivot joint: Neck
 - iii. Gliding joint: Wrist
 - iv. Hinge joint: Knee

What are the characteristics of bones?

* Bones are complex living structures that grow, develop, and repair themselves.

COMPACT BONE: hard and dense bone that contains the minerals that give bones strength

SPONGY BONE: lightweight bone with small spaces found within. Found at the end of long bones underneath compact bone.

MARROW: Connective tissue that fills the spaces in some spongy bone.

- 1) Red bone marrow: produces most of your blood cells
- 2) Yellow bone marrow: stores fat

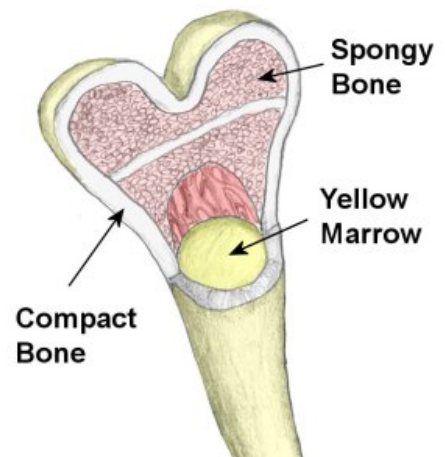
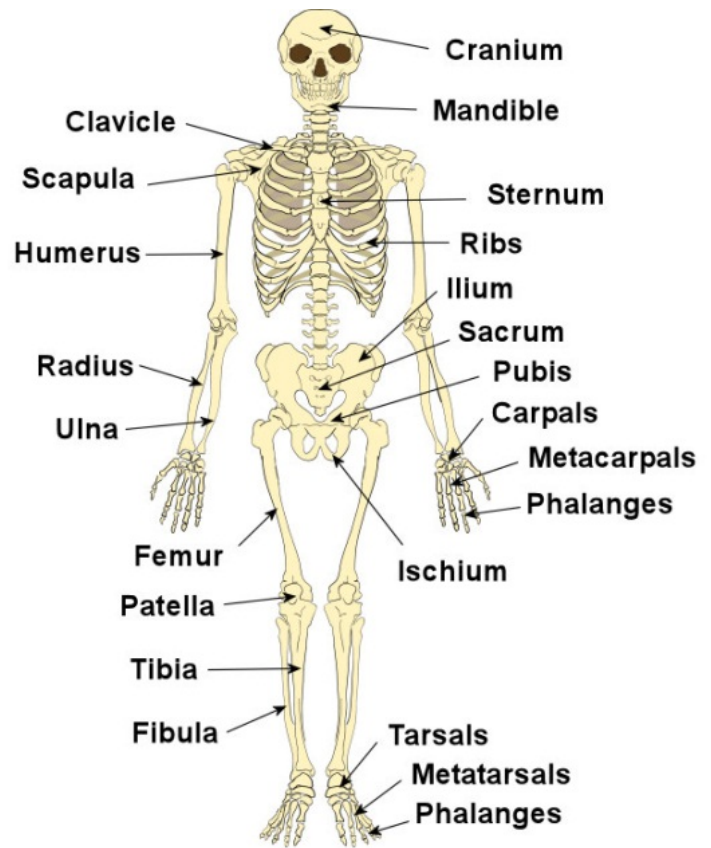
CARTILAGE: a strong connective tissue that is more flexible than bone.

- Most of a baby's skeleton is made of cartilage.
- As a baby grows, cartilage is replaced with bone.
- Some cartilage still in adult skeleton – ends of bones, ears, and nose.

To keep bones healthy:

- Balanced diet
- Regular exercise
- Calcium

OSTEOPOROSIS: a condition in which bones become weak and break easily.



Lesson 2.2: The Muscular System

What muscles are in your body?

INVOLUNTARY MUSCLES: muscles not under your conscious control.

Name: _____

Block: _____

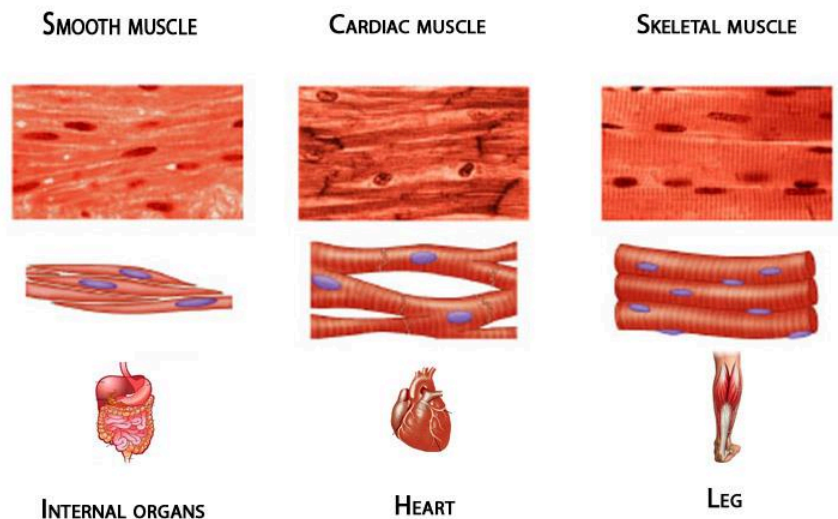
- Involved in activities like digestion, breathing, blinking.

VOLUNTARY MUSCLES: muscles under your conscious control.

- Involved in activities like smiling, writing, running.

Your body has 3 main muscle types:

- 1) **SKELETAL MUSCLE:** provide the force needed to move bones.
 - a. **STRIATED MUSCLE:** appear banded, or stripped
 - b. **TENDON:** connective tissue that attaches the muscle to a bone.
 - c. All voluntary muscles
- 2) **SMOOTH MUSCLE:** muscle found inside of many internal body organs and control certain movements inside body.
 - a. Not striated
 - b. Involuntary muscles
- 3) **CARDIAC MUSCLES:** muscle only found in the heart.
 - a. Involuntary
 - b. Striated muscle



How do skeletal muscles work?

Skeletal muscles work in pairs – one can contract while the other muscle in the pair relaxes.

- Example: Bicep and triceps

To keep muscles healthy:

- Regular exercise
- Healthy diet
- Stretching, warming up and cooling down

Lesson 2.3: The Skin

What are the functions and structures of the skin?

- Protect the body
 - Forms a barrier that keeps harmful substances outside the body and keeps helpful substances inside the body.
- Regulate body temperature
 - When temperature is too high:
 - Sweat
 - Blood vessels get larger and move closer to the surface of skin
 - When temperature is too low:
 - Goosebumps
 - Blood vessels get smaller and move further away from the skin
- Eliminate waste
 - Perspiration contains dissolved waste products that leaves through sweat
- Gather information about the environment
 - Nerves in skin collect info from the environment like pressure, temperature, and pain
- Produce vitamin D
 - Make vitamin D in the presence of sunlight
 - Vitamin D is needed for healthy bones.

Structure of Skin

The skin has 2 layers: epidermis and dermis.

Name: _____

Block: _____

EPIDERMIS: outer layer of the skin where new skin cells form.

MELANIN: pigment found in epidermis that colors the skin.

DERMIS: the inner layer of the skin that includes nerves, blood vessels, sweat glands, hairs, and oil glands.

PORES: openings that allow sweat to reach the surface.

FOLLICLES: structure in dermis where strands of hair grow.

How can you have healthy skin?

- Healthy diet
- Keep skin clean
- Limit time in the sun

CANCER: a disease in which some cells divide uncontrollably.

