**Chapter One**

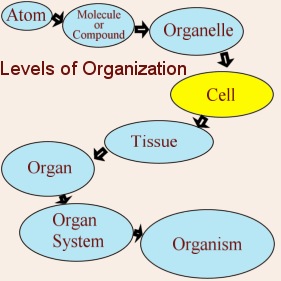
**The Human Body: An Orientation**

Lesson Objectives:

By the end of this chapter, you will be able to…

* ***Describe*** the different levels of organization in the human body.
* ***Describe*** anatomical position and use the descriptive and directional terms that refer to body structures, surfaces, and regions.
* ***List*** the regions of the body and the localized areas within each region.
* ***Identify*** body cavities and the organs found within each.
* ***Define*** homeostasis and describe its significance.
* ***List*** the characteristics of life.
* ***Describe*** the components of a negative and positive feedback loop and explain how each helps to maintain homeostasis.
* ***Discuss*** the key historical events in the development of anatomy and physiology.

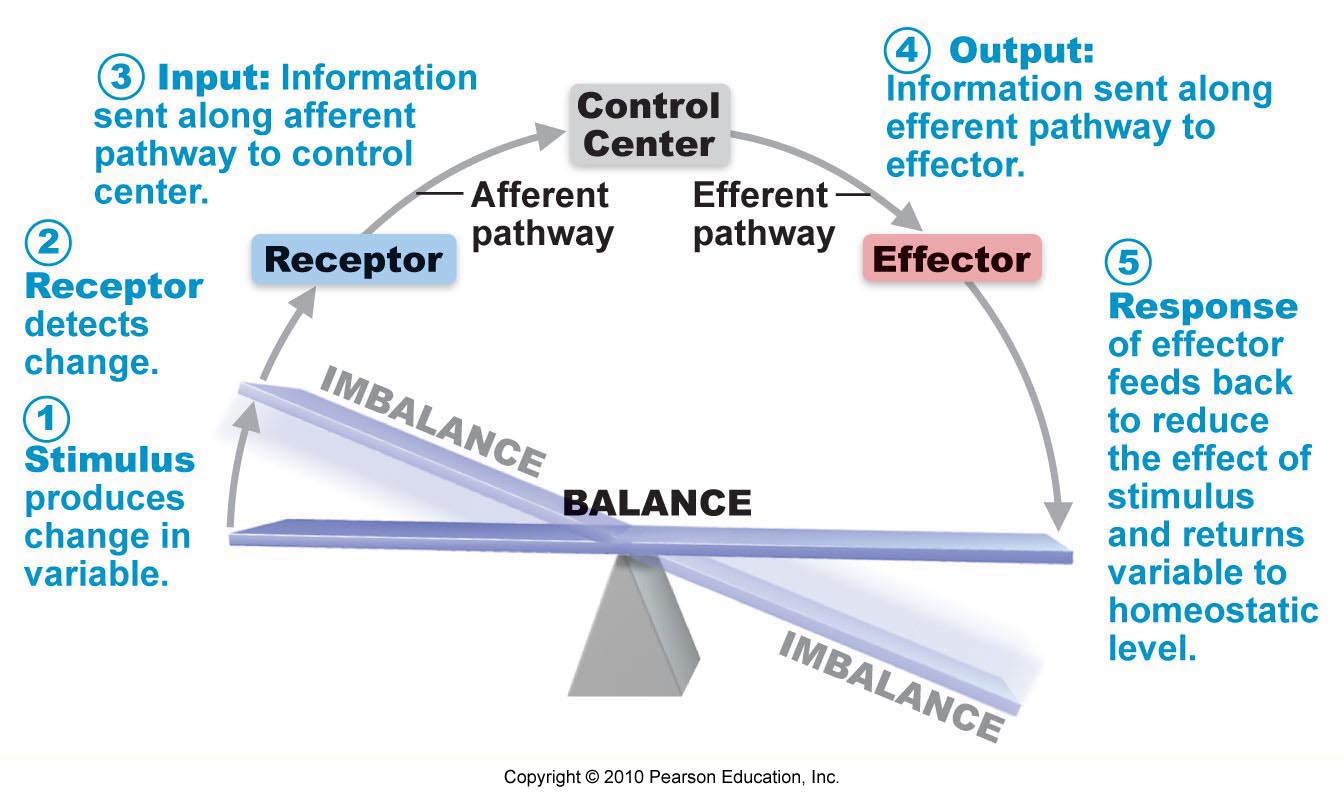
1. **Overview**

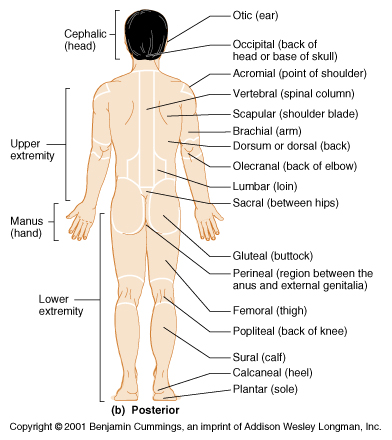
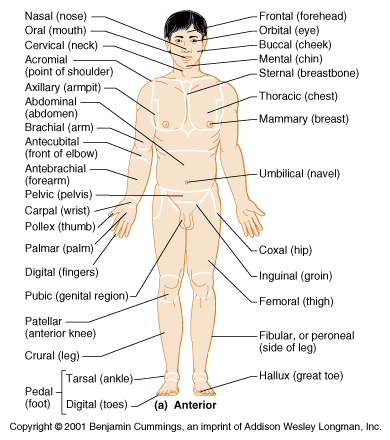
* **Anatomy**:
  + “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of body parts.
  + Means “\_\_\_\_\_\_\_\_\_\_\_\_\_\_”
  + Dissection of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the basis for understanding the structure of the human body
* **Physiology**:
  + “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of body parts.
  + What these body parts do and how they do it.
  + Means “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”
  + Much of the knowledge of physiology is gained through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \*A & P are very closely related – function is closely related to \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_
* **Essential Concept:** The Hierarchy of Structural Organization
  + Chemical:
    - \_\_\_\_\_\_\_\_\_\_\_\_\_ combine to form molecules.
    - Different types of molecules:
      * small \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * small \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Cellular:
    - Cells are made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - \_\_\_\_\_\_\_\_\_\_\_\_\_ and organelles are assembled from various molecules.
    - **\*\*\*\_\_\_\_\_\_\_\_\_\_\_\_\_ –** the basic structural and functional units of the organism
    - Cells are specialized for particular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, e.g., muscle cells are specialized for contracting
    - Cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are sub-compartments with specialized tasks
  + Tissue:
    - Tissues consist of similar types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - Groups of different cell types cooperate to perform specific functions.
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
    - Two or more different tissue types are organized to perform specific functions.
  + Organ System:
    - Organ systems consist of different \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that work together closely and cooperate in a related function.
  + Organism: (Human Being)
    - The human organism is made up of many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - All of the organ systems working together to maintain life constitute the living organism

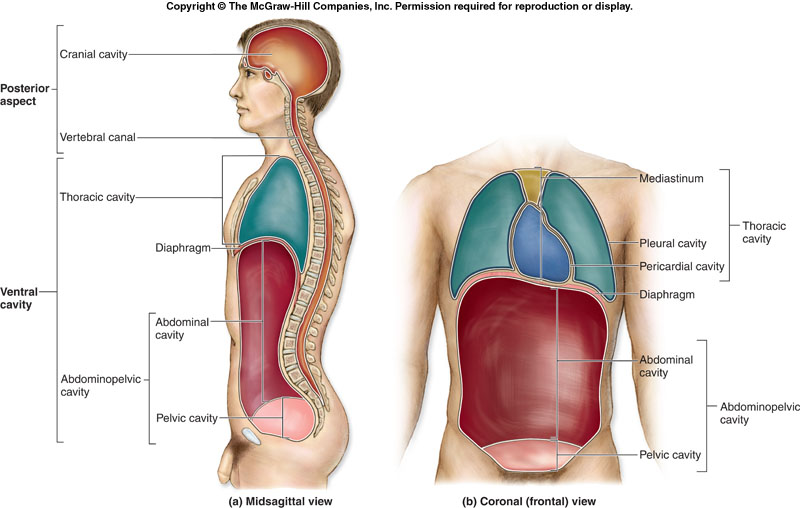
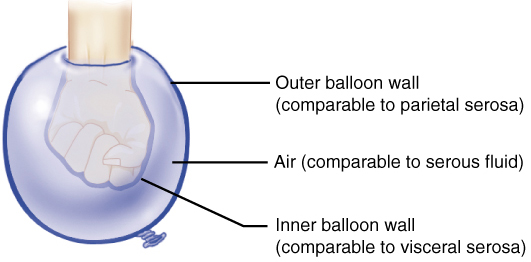
1. **Characteristics that make life unique**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Self initiated change in position
  + Motion of internal parts
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ :
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Ability to sense changes within, or around the organism
  + React in response to surroundings
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Increase in body size
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Parents produce offspring / producing new individuals
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Obtaining oxygen (O2 ⇧), using it to release energy from food substances, and getting rid of wastes
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Chemically changing (breaking down) food substances
  + Getting rid of wastes
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Passage of digested products (food substances) through membranes and into body fluids
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Movement of substances throughout the body
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Changing absorbed substances into chemically different substances
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:
  + Removal of wastes

1. **Homeostasis**

* Survival needs
  + Things required for an organism’s survival
    1. Atmospheric pressure – for gas exchange
  + All, except E above, must be maintained within fairly narrow ranges
* Necessary life functions
  + METABOLISM:
    1. All physical and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes occurring in an organism
    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       - Anabolism:
         * a metabolic process in which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to make compounds and tissues from simple molecules
         * \_\_\_\_\_\_\_\_\_ smaller units to make a larger one
       - Catabolism:
         * the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ through the conversion of complex molecules into simpler ones
         * \_\_\_\_\_\_\_\_\_\_\_\_\_\_ apart larger unit to make many smaller ones
  + HOMEOSTASIS:
    1. Tendency of the body to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a stable, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ internal environment.
    2. “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”
    3. Accomplished through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ adjustments
* Homeostatic Systems
  + Three basic components
    1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
       - detects change in a variable (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/stress)
       - sends input (\_\_\_\_\_\_\_\_\_\_\_\_\_\_) to a control center
    2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
       - assesses input; sends output to effector(s)
    3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
       - causes response, i.e., an “effect” which is triggered by output
  + Negative Feedback Loop
    1. Results in a return to homeostatic equilibrium because the **response \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ stimulus (stress)**
    2. Examples:
       - Regulation of blood \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       - Regulation of body \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       - Most other physiological mechanisms
  + Positive Feedback Loop
    1. Results in a shift to a new homeostatic equilibrium because the **response \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the stimulus level (stress)**
    2. [“\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ effect”]
    3. Examples:
       - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/Childbirth
       - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ responses
    4. Most are responses to special conditions resulting in a \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ physiologic state
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    1. Pathological processes with a particular set of characteristics in which some or all parts of the body are not functioning correctly
       - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ may be local or systemic
       - different systemic changes are present and may suggest a cause
         * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** - subjective changes in body function, not observable; reported by the individual, e.g., pain
         * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** - objective changes which are observable, e.g., temperature, pulse

1. **Anatomical Terminology:** Anatomic terms describe directions within the body as well as the body’s reference planes, cavities, and regions.
   * **Anatomical position:** a constant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ point
   * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ terms:** help you determine the exact location of a structure when navigating the body
   * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ terms:** used to designate body areas that have perform special functions
     + Axial
     + Appendicular
   * Directional Terms
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** above
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** below
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** toward the front
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** toward the back
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** can be used instead of anterior
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** can be used instead of posterior
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** toward the body’s **m**idline
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** away from the body’s midline
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** closest to the point of origin
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** farthest from the point of origin
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** lying face up
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** lying face down
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** (aka - Cephalic) toward the head
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** toward the tail
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** On the same side of the body or structure
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** On the opposite side of the body or structure
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** Closer to the surface
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** Farther down below the surface
   * Anatomical Position

* General Organization of the Body
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Portion - head, neck, trunk
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Portion - arms & legs
  + 1. Several body cavities  
    2. Layers of membranes within cavities  
    3. Variety of organs and organ systems within cavities (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = internal organs. "Visceral organs")
* Body Planes and Sections
  + Body Planes
    - Mid-\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Sagittal)
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cross)
  + Body Cavities
    - Dorsal body cavity
    - Ventral body cavity
      * thoracic
      * Abdominopelvic
  + Other Body Cavities
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavity – mouth
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavity – located in the nose
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavities – house the eye
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ear cavities – contain the small bones of the middle ear
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cavities – within capsule around freely moveable joints
  + Membranes
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Membrane - two layered, covers organs
      * Outer layer = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Inner layer = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (lines the organs)
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fluid – lubricating fluid
    - Pleura = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Pericardium = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Peritoneum = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (abdominopelvic region)
    - Membranes in the Ventral Cavity
      * Like a “Fist in a balloon”
      * Membrane inside a membrane with a narrow enclosed space in between
        + parietal

the outer membrane

on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_

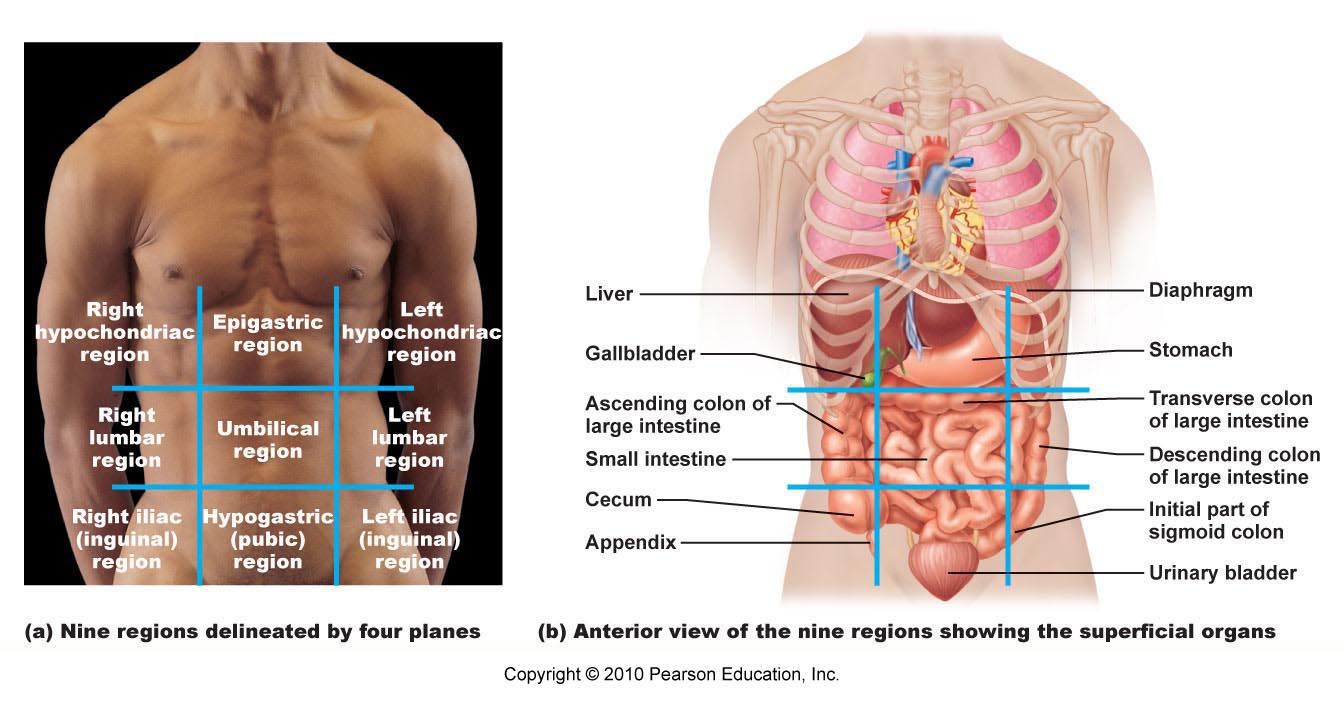
* + - * + visceral

the inner membrane

on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - * + space

filled with watery fluid

* + - * Body cavity lined with serous membrane (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) which produces the serous fluid
      * Membrane named depending on its position, and the cavity’s organs inside
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (layer around heart)
        + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (layer right on top of heart)
  + 9 Body Regions
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** 
      * the area around the belly button
      * **includes** – parts of the large and small intestine, \_\_\_\_\_\_\_\_\_\_\_\_\_ & abdominal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** 
      * superior to the umbilical region
      * **includes** – most of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, portions of stomach, \_\_\_\_\_\_\_\_\_\_\_\_\_, inferior vena cava, & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (pubic):** 
      * inferior to the umbilical region
      * **includes** – urinary \_\_\_\_\_\_\_\_\_\_\_\_\_, ureters, \_\_\_\_\_\_\_\_\_\_\_\_ & ovaries (females).
    - **Right & Left \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** 
      * **(\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**
      * on either side of the hypogastric
      * **includes** – portions of the small and large \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - **Right & Left \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_):** 
      * either side of the umbilical region
      * **includes** – portion of intestines and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - **Right & Left \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** 
      * either side of the epigastric region
      * **includes** – \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_, right side of liver, part of pancreas.

1. TEN Organ Systems

|  |  |
| --- | --- |
| **ORGAN SYSTEMS** | |
| 1. | Body covering.  Examples: Skin, hair, nails, sweat glands. Function: protect underlying tissues and regulate body temperature |
| 2. | Examples: Bones, ligaments, cartilage Function: Support, movement, protection, and production of blood cells |
| 3. | Muscles of the body  Examples: cardiac, smooth, skeletal Function: Movement, maintenance of posture, production of body heat |
| 4. | Examples: Brain, spinal cord, neurons, neuroglia  Function: Communicating stimuli, mental processing, maintaining homeostasis |
| 5. | Examples: Ductless glands   * Pituitary * Adrenal * Thyroid * Pancreas * Ovaries * Testes * Thymus * Pineal glands   Function: Secretion of hormones, communication between body parts |
| 6. | Examples:   * Mouth, teeth, pharynx, esophagus, stomach, small intestine, large intestine * liver, gall bladder, and many glands including the pancreas   Function: Breakdown of food substances into simpler forms that can be absorbed (digestion). |
| 7. | Examples: Heart, blood vessels, blood.  Function: Transports materials throughout the body.  \***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (#10)** usually included with the circulatory system |
| 8. | Examples: Kidneys, ureters, urinary bladder, urethra Function:   * Removes ("filters") wastes from the blood * helps maintain the body's water and electrolyte balance |
| 9. | Examples: Reproductive organs, primarily the ovaries (females) and testes (males) Function: Produce special reproductive cells for reproduction |

1. Historical Development of Anatomy and Physiology
   * **Hippocrates**
     + Father of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + Attributed disease to natural causes rather than to the displeasure of the gods
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** when blood, yellow bile, black bile, and phlegm were balanced, the person would be healthy and have an even disposition
       1. **Humor = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
   * Agents in Metabolism – humoral theory
     + The **Four Humors** are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the four elements in the human body.
     + The right balance and purity of them is essential to maintaining health.
     + The Four Humors and the elements they serve are as follows:
       1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – AIR**
       2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - WATER**
       3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - FIRE**
       4. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – EARTH**
   * **The Four Temperments**
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ :* blood** predominate
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** too much **yellow bile**
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** overproduction of **black bile**
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***: too much **phlegm**
   * **Aristotle** 
     + First known account of ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
     + Described the development of a heart in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ embryo
     + Established a type of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for obtaining data
   * **Erasistratus:**
     + ***Father of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***
     + Interested in what caused diseases and disorders and what organs were affected
     + Some of his ideas were still based on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ concepts
   * **Herophilus:**
     + Criticized for the use of vivisection
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** dissection of living animals
     + Described as a ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** who had dissected as many as \_\_\_\_\_\_\_\_ living human beings, some of them in public demonstrations
   * **Claudius Galen: (Roman Era)**
     + Believed in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + Explained nearly all bodily functions
     + Work contained MANY errors because he made conclusions regarding human functions on the basis of data obtained from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   * Middle Ages
     + Dissections of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ were totally prohibited during this period
     + Examination by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ were allowed for mysterious deaths
     + During the plague epidemic, a few necropsies were allowed in hope to determine its cause
     + ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:*** Post-mortem examination of a non-human animal
   * Renaissance
     + Characterized by a rebirth of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + Vesalius
       1. Father of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       2. Challenged \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_’s teachings
       3. Beautifully \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and described body systems and individual organs in a book
   * 17th and 18th Centuries
     + **William Harvey** 
       1. explanation of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ flow
       2. Father of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + **Antoni van Leeuwenhoek**
       1. Development and use of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
       2. Achieved magnification of \_\_\_\_\_\_\_\_\_\_\_\_ times
       3. View \_\_\_\_\_\_\_\_\_\_\_ cells and striated appearance of \_\_\_\_\_\_\_\_\_\_\_\_\_
   * 19th and 20th Centuries
     + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
       1. All living organisms are composed of cells and the products of cells
     + Anatomy and Physiology has become highly specialized due to the increase of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_