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Organization

Anatomy 14

Human Anatomy & Physiology

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Biology, Anatomy & Physiology

Definitions:

- **Biology**
 - The scientific study of life
- **Anatomy**
 - The study of structure and relationships among structures
- **Physiology**
 - The study of the functions of the body
 - How the body parts work

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Characteristics of Life

- Eats for energy
- Senses and responds to environmental changes
- Reproduces and grows
- Cell(s)
- Homeostasis

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Levels of Organization

- Chemical (simplest)
- Cell
- Tissue
- Organ
- System
- Organism (most complex)
- **Populations**
- **Communities**
- **Ecosystems**
- **Biosphere**



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What Is Science?

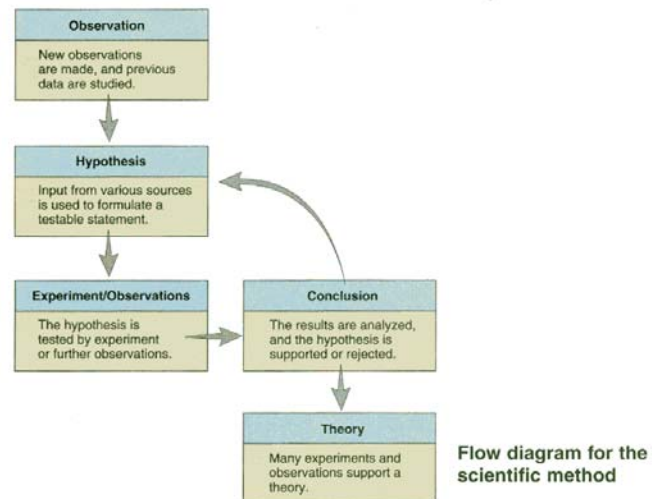
Definition:

- A systematic way of gathering knowledge about the natural world

Scientific Method

- Observation
- Hypothesis
- Prediction
- Experimentation
- Conclusion

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Principal Systems of the Body

- Integumentary
- Skeletal
- Muscular
- Nervous
- Endocrine
- Cardiovascular
- Lymphatic & Immune
- Respiratory
- Digestive
- Urinary
- Reproductive

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Integumentary System

- **Structures:**
 - Skin, hair, nails, sweat & oil glands
- **Important Functions:**
 - Helps regulate body temperature
 - Protects the body
 - Receives stimuli
 - pain, pressure & temperature



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Skeletal System

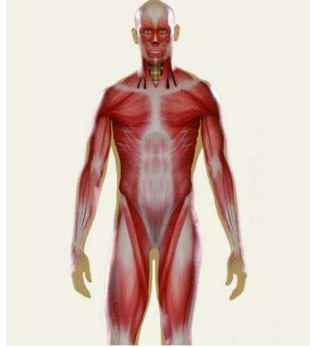
- **Structures:**
 - All the bones, associated cartilages & joints
- **Important Functions:**
 - Supports and protects the body
 - Assists with body movements
 - Houses cells that produce red blood cells



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Muscular System

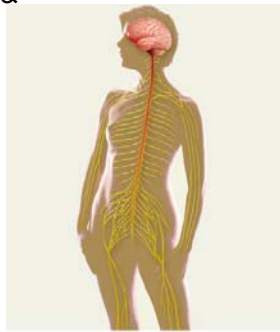
- **Structures:**
 - Skeletal muscle tissue attached to bone
- **Important Functions:**
 - Helps bring about movement
 - Maintains posture



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Nervous System

- **Structures:**
 - Brain, spinal cord, nerves & sense organs
- **Important Function:**
 - Regulates body activities through fast moving nerve impulses



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Endocrine System

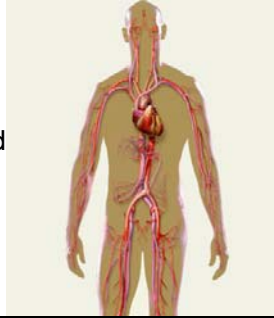
- **Structures:**
 - All glands and tissues that produce hormones
- **Important Function:**
 - Regulates body activities through chemical messengers (hormones) transported by the circulatory system to various target organs



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Cardiovascular System

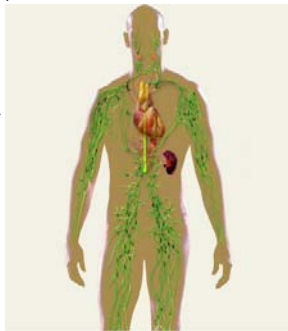
- **Structures:**
 - Blood, heart, and blood vessels
- **Important Functions:**
 - Distributes oxygen and nutrients to cells
 - Carries carbon dioxide and wastes from cells
 - Helps regulate body temperature



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Lymphatic & Immune System

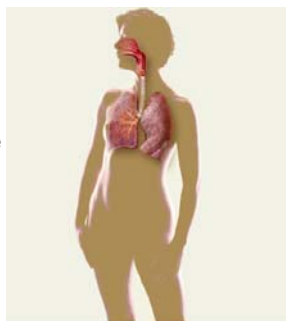
- **Structures:**
 - Lymph, lymphatic vessels, lymphoid organs
- **Important Functions:**
 - Returns protein & plasma to circulatory system
 - Protects body from disease-producing organisms



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Respiratory System

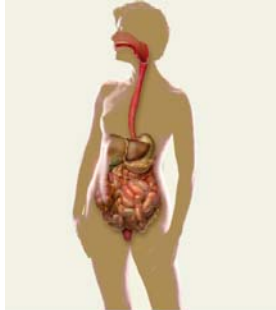
- **Structures:**
 - Lungs and associated passageways
- **Important Functions:**
 - Supplies oxygen
 - Eliminates carbon dioxide
 - Helps produce vocal sounds



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Digestive System

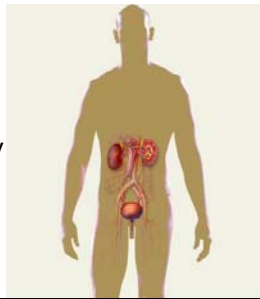
- **Structures:**
 - Gastrointestinal tract and associated organs
- **Important Functions:**
 - Breaks down and absorbs food for use by cells
 - Eliminates solid and other wastes



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Urinary System

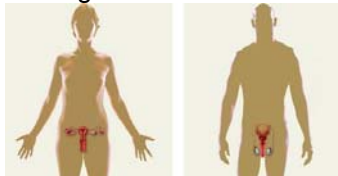
- **Structures:**
 - Kidneys, ureters, urinary bladder, and urethra
- **Important Functions:**
 - Regulates the volume and composition of blood
 - Eliminates waste from body



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Reproductive System

- **Structures:**
 - Organs that produce reproductive cells and organs that transport, store and nourishment of reproductive cells
- **Important Functions:**
 - Responsible for continuation of human race
 - Produces hormones that regulate metabolism



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Homeostasis

A state of balance or equilibrium in which the body's internal environment remains within certain physiological limits

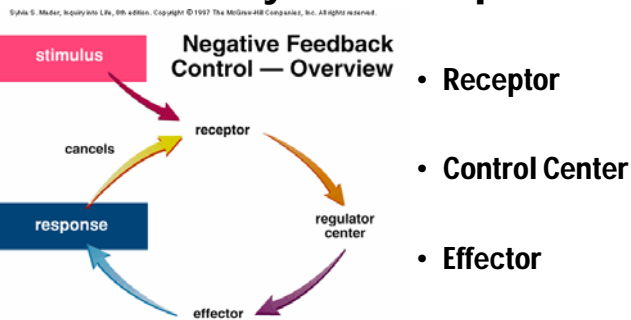
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Examples of Homeostasis

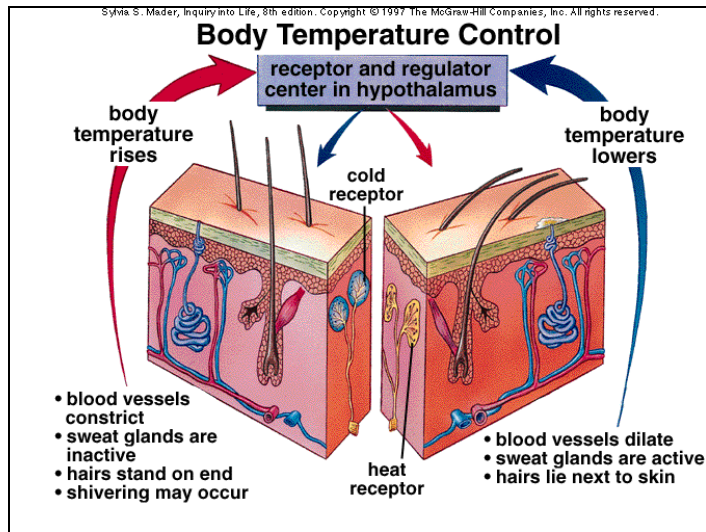
- Blood pressure
- Heart rate
- Blood sugar
- Body temperature
- Breathing rate

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Feedback System Components



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Types of Feedback Systems

- **Negative Feedback Systems**
 - Most common
 - Requires frequent monitoring & adjustments
 - Examples:
 - Regulation of blood pressure, blood sugar & body temperature
- **Positive Feedback Systems**
 - Examples:
 - Blood clotting & labor contractions

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Language of Anatomy

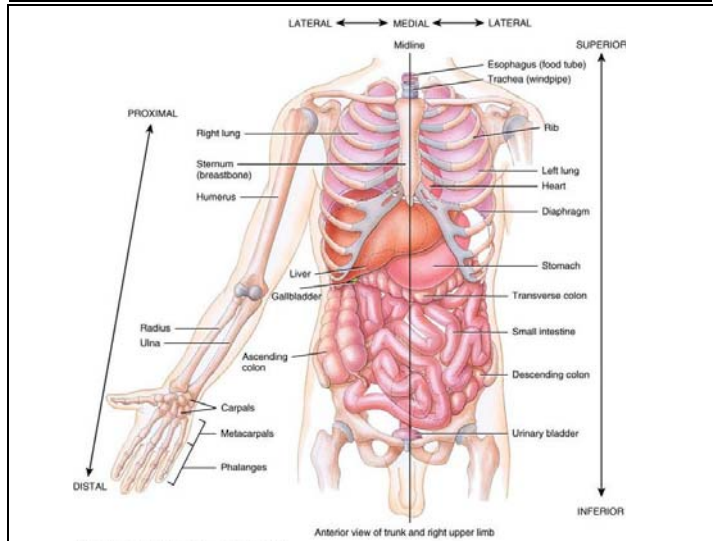
- **Anatomical position**
- **Directional terms**
- **Body planes**
- **Body cavities**

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Directional Terms

- Superior
- Inferior
- Anterior
- Posterior
- Medial
- Lateral
- Proximal
- Distal
- Superficial
- Deep
- Ipsilateral
- Contralateral

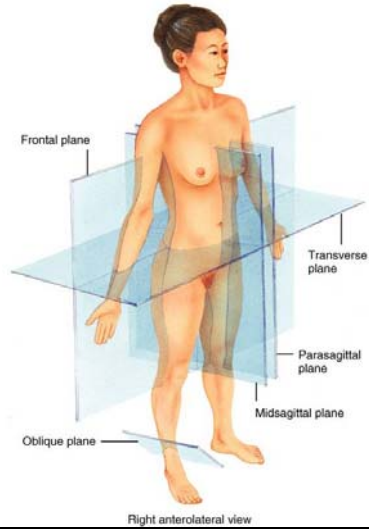
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Planes of the Body

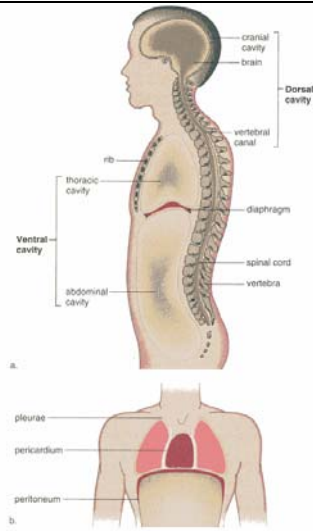
- Frontal
- Transverse
- Sagittal
– Median
- Oblique



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Body Cavities

- **Dorsal**
 - Cranial
 - Vertebral
- **Ventral**
 - Thoracic
 - Abdominopelvic



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The End