HUMAN BODY BASICS

BENCHMARK: H.E.912.L.1.3, L.A.910.2.2.3

TEXTBOOK: Chapter 1

KEY VOCABULARY: homeostasis, positive feedback, negative feedback, inferior, superior, posterior, anterior, lateral, medial, ventral, dorsal

STUDENT TASKS:
1. Define homeostasis, including positive/negative feedback.
2. Use proper anatomical terminology as applied to body structures.

SAMPLE QUESTION:
1. Feedback mechanisms are best described as processes that help:
   Ⓐ reduce hormone levels to below normal in the blood
   Ⓑ destroy hormones in the blood
   Ⓒ directly control muscle contraction in the leg
   Ⓓ keep body conditions near a normal, steady state

2. The humerus is ________________ to the sternum.
   Ⓐ posterior  Ⓑ superior
   Ⓑ ventral  Ⓒ lateral

CHEMISTRY

BENCHMARK: L.18.4, L.18.11

TEXTBOOK: Chapter 2

KEY VOCABULARY: carbohydrates, enzymes, amino acids, proteins, cholesterol, triglycerides

STUDENT TASKS:
1. Identify the actions of enzymes.
2. Identify the building blocks and functions of biological molecules.

SAMPLE QUESTION:
1. Salivary amylase is an enzyme produced in the mouth and starts chemical digestion by:
   Ⓐ breaking down carbohydrates Ⓑ combining lipids
   Ⓑ breaking down amino acids Ⓒ breaking peptide bonds

2. The basic units of a carbohydrate are:
   Ⓐ amino acids Ⓑ monosaccharides
   Ⓑ fatty acids Ⓒ enzymes
CELLS AND TISSUES

BENCHMARK: L.14.2, L.14.11

TEXTBOOK: Chapter 3

KEY VOCABULARY: ribosomes, centrioles, nuclei, endoplasmic reticulum, mitochondria, ATP, epithelial tissue, adipose tissue, cartilage, muscle, skeletal muscle, smooth muscle, ciliated epithelial, cardiac muscle, diffusion, osmosis

STUDENT TASKS:
1. Recognize the processes of diffusion and osmosis.
2. Identify organelles of a cell and identify major functions.
3. Define tissues.
4. Identify the 4 types of tissues and their characteristics.

SAMPLE QUESTION:

1. Which letter in the diagram indicates an organelle that functions primarily in the synthesis of long chains of amino acids?
   - A
   - B
   - C
   - D

2. A student is viewing a tissue that is striated and voluntary. This tissue is:
   - smooth muscle
   - cartilage
   - cardiac muscle
   - skeletal muscle

3. Match the picture of the tissue with the correct name:
   - simple cuboidal epithelium
   - skeletal muscle tissue
   - stratified squamous epithelium
   - cardiac muscle tissue
   - simple squamous epithelium
SKIN

BENCHMARK: SC.912.L.14.51

TEXTBOOK: Chapter 4

KEY VOCABULARY: serous membranes, cutaneous membranes, mucous membranes, synovial membrane, sweat glands, melanin, sebum, sebaceous gland, carotene, hemoglobin

STUDENT TASKS:
1. Know function and location of 4 membrane types.
2. Identify functions of the skin, including accessory structures.
3. Identify skin structures on a diagram.
4. Name factors that determine skin color.

SAMPLE QUESTION:
1. Membranes that line body cavities that lack openings to the outside are:
   Ⓐ serous  Ⓑ synovial
   Ⓒ cutaneous  Ⓓ mucous
2. A coiled structure in the skin that secretes water, salt, urea, and other wastes is known as:
   Ⓐ pore gland  Ⓒ sebaceous gland
   Ⓑ sweat gland  Ⓓ sebum gland

SKELETON


TEXTBOOK: Chapter 5

KEY VOCABULARY: appendicular, axial, femur, sternum, metacarpals, scapula, xiphoid process, endoskeleton, Haversian (central) canal, osteon (Haversian) system, bone marrow, osteocytes, periosteum, epiphysis, diaphysis, endosteum

STUDENT TASKS:
1. Identify the major bones of the axial and appendicular skeletons.
2. Describe the functions of the skeletal system.
3. Identify histology of compact bone tissue.
4. Identify major bone markings of axial skeleton.
5. Identify the major anatomical areas of a long bone.

SAMPLE QUESTION:
1. Identify all the bones listed below that belong to the axial skeleton:
   Ⓐ 2 and 3  Ⓑ 1, 2, and 3
   Ⓒ 1, 3, and 4
2. The shaft of the long bone is called the:
   Ⓐ endosteum  Ⓑ diaphysis
   Ⓒ periosteum  Ⓓ epiphysis
MUSCLES


TEXTBOOK: Chapter 6

KEY VOCABULARY: cardiac muscle, smooth muscle, skeletal muscle, involuntary muscle, voluntary muscle, striated muscle, sliding filament theory, sarcomere, myosin, actin, synapse, cross-bridges, neurotransmitter, anaerobic respiration, lactic acid, acetylcholine, biceps, gluteus maximus, pectoralis major, rectus femoris, rectus abdominis

STUDENT TASKS:
1. Identify the 3 types of muscle tissue and their characteristics.
2. Describe the events of muscle cell contraction (sliding filament theory).
3. Identify major muscles used in basic exercise movements.
4. Know the consequences of anaerobic respiration during exercise

SAMPLE QUESTION:
1. According to the sliding filament theory, which of the following forms cross-bridges to create movement?
   ₪ action-ATP ₪ myosin-actin
   ₪ neuron – motor end plate ₪ sarcomere- myofibril
2. The major muscle groups being used to perform a squat are:
   ₪ pectoralis major (pecs) and biceps brachii (biceps)
   ₪ rectus abdominis (abs)
   ₪ latissimus dorsi (lats)
   ₪ gluteus maximus (glutes) and rectus femoris (quads)

DIGESTION

BENCHMARK: L.14.45, L.14.46

TEXTBOOK: Chapter 14

KEY VOCABULARY: Digestion, pancreas, esophagus, small intestine, gall bladder, liver, large intestine, gastrointestinal tract, villi, bile, emulsify, peristalsis, gastric juice

STUDENT TASKS:
1. Identify organs and accessory organs of the alimentary canal.
2. Identify the functions of small intestine, large intestine, liver, esophagus, and stomach.
3. Describe chemical digestion in terms of pH and enzymes.

SAMPLE QUESTION:
1. The absorptive surface of the small intestine is greater than that of other human digestive organs because of its length and the presence of
   ₪ alveoli ₪ villi
   ₪ neurons ₪ nephrons
2. In a human, peristalsis occurs in which organs?
   - salivary gland, esophagus, and stomach
   - stomach, small intestine, and pancreas
   - esophagus, stomach, and small intestine
   - esophagus, small intestine, and liver

**URINARY**

**BENCHMARK:** L.14.47, L.14.48

**TEXTBOOK:** Chapter 15

**KEY VOCABULARY:** kidney, ureter, urinary bladder, urethra, nephron, glomerulus

**STUDENT TASKS:**
1. Identify the pathway of urine flow.
2. Identify factors that affect quantity of urine formation.
3. Identify organs of the urinary system and nephrons in a diagram.

**SAMPLE QUESTION:**
1. In humans, the immediate result of a blockage in one ureter would be to:
   - limit the ability to store urine
   - prevent filtration of the blood
   - stop the release of urine from the body
   - decrease the amount of urine entering the bladder

2. Which structure is INCORRECTLY paired with its function?
   - urethra – carries urine outside body
   - nephron – reabsorbs substances
   - ureter – carries urine to the bladder
   - bladder – urine storage

**RESPIRATORY**

**BENCHMARK:** L.14.43, L.14.44

**TEXTBOOK:** Chapter 13

**KEY VOCABULARY:** trachea, pharynx, alveolus (alveoli), diaphragm

**STUDENT TASKS:**
1. Describe the structures of the respiratory system and their functions.
2. Describe the gas exchange that occurs in an alveolus.
3. Recognize graphically the changes in carbon dioxide levels during exercise.

**SAMPLE QUESTION:**
1. Which part of the human respiratory system is a thin, moist membranous structure where gas exchange occurs?
   ⬅ trachea    ⬙ epiglottis
   ⬇ bronchus    ⬘ alveolus

2. An increase in breathing rate can be triggered by an increase in the
   ⬗ carbon dioxide content of the blood
   ⬕ oxygen content of the atmosphere
   ⭕ number of platelets in the blood
   ⭝ number of red blood cells

---

**BLOOD, CARDIOVASCULAR, AND LYMPHATIC**


**TEXTBOOK:** Chapters 10, 11, 12

**KEY VOCABULARY:** red blood cells, white blood cells, lymphocytes, platelets, antibody, antigen, immune response, lymphatic system

**STUDENT TASKS:**
1. Recognize and describe the functions of the formed elements of blood.
2. Describe the structure of arteries, veins, and capillaries.
3. Recognize lymph nodes in a diagram and identify function.
4. Recognize the differences between the A, B, O blood groups.
5. Recognize the correct path of blood flow through the heart as viewed on a diagram

**SAMPLE QUESTION:**
1. Which part of the blood is correctly paired with its function?
   ⬗ red blood cells – fight infection
   ⭕ plasma – transports wastes and hormones
   ⭖ platelets – produce antibodies
   ⭝ white blood cells – carry oxygen

2. Which sequence represents the correct pathway of blood flow through the heart?
   ⭕ right atrium, right ventricle, left ventricle, left atrium
   ⭖ right atrium, left ventricle, left atrium, right ventricle
   ⭝ right atrium, right ventricle, left atrium, left ventricle
   ⭝ right atrium, left atrium, right ventricle, left ventricle
NERVOUS SYSTEM AND SPECIAL SENSES


TEXTBOOK: Chapters 7, 8

KEY VOCABULARY: neurons, electrochemical messages, cerebellum, brain stem, diencephalon, cerebrum, central nervous system, peripheral nervous system, sympathetic nervous system, somatic nervous system

STUDENT Tasks:
1. Identify structures and functions of the central and peripheral nervous systems, including sympathetic nervous system.
2. Identify the 4 major parts of the brain in a diagram and know their functions.
3. Describe a neuron and the events that lead to a nerve impulse.
4. Identify the special senses.

SAMPLE QUESTION:
1. A blind student reads a page printed in a braille textbook, while a sighted student reads a regular textbook. Both students are able to obtain and process the information most directly as a result of the activities of the
   ₦ sensory neurons and cerebrum
   ₦ involuntary muscles and cerebrum
   ₦ interneurons and spinal cord
   ₦ smooth muscles and medulla

2. A hiker hears the rattle of a snake and jumps back two feet in response. This is an example of using:
   ₦ the sympathetic and peripheral nervous systems
   ₦ the central nervous system only
   ₦ the somatic nervous system only
   ₦ the central and sympathetic nervous systems

ENDOCRINE AND REPRODUCTION


TEXTBOOK: Chapters 9, 16

KEY VOCABULARY: endocrine system, pituitary, ovary, testes, estrogen, testosterone, placenta, fertilization, uterus, fallopian tube, scrotum, ovulation, amniotic fluid, umbilical cord, implantation, menstruation

STUDENT TASKS:
1. Describe the endocrine system, including the pituitary gland.
2. Identify hormones as the regulatory chemicals of the endocrine system.
3. Recognize the structures and functions of the male and female reproductive system using a diagram.
4. Identify the stages of reproduction from ovulation to implantation using a diagram.
5. Describe the function of the amniotic sac and amniotic fluid.
SAMPLE QUESTION:
1. Base your answer on the diagram below. Select the structure that is best described by that statement.

This structure produces sex hormones that regulate female secondary sex characteristics.

Ⓐ 1  ⎪ 3
Ⓑ 2  ⎪ 4

2. In a male, blockage of both vas deferens would interfere with the:
Ⓐ transfer of sperm to a female
Ⓑ production of sperm
Ⓒ production of urine
Ⓓ removal of urine from the body