

## Strand 1

### **BODY PLAN AND ORGANIZATION**-(Students will explore and describe the body plan, organization, and homeostasis)

#### **Standard 1**

Contrast the sciences of anatomy with physiology

#### **Standard 2**

Describe the six levels of structural organization of the human body and give an example of each level.

- a. Chemical
- b. Cellular
- c. Tissue
- d. Organ
- e. System
- f. Organism

#### **Standard 3**

Describe the following:

- a. Metabolism
  - o Anabolic process
  - o Catabolic process

#### **Standard 4**

Apply directional terms used in human anatomy.

- a. Posterior/Anterior
- b. Medial/Lateral
- c. Proximal/Distal
- d. Superficial/Deep
- e. Superior/Inferior

#### **Standard 5**

Apply commonly used planes to divide the body.

- a. Sagittal
- b. Midsagittal
- c. Transverse (horizontal)
- d. Frontal (coronal)

#### **Standard 6**

Identify the body cavities and locate the following organs within each cavity.

- a. Dorsal Cavity
  - o Vertebral - Spinal Cord
  - o Cranial - Brain
- b. Ventral Cavity
  - o Thoracic - Heart & Lungs

- Mediastinal - heart, bronchi, esophagus, thymus
- Pericardial – Heart
- Pleural - Lungs
- c. Abdominopelvic Cavity-liver, spleen, intestines, kidneys, stomach
  - Abdominal-liver, spleen, intestines, kidneys, stomach
  - Pelvic-intestines, urinary bladder, sex organs

**Standard 7**

Identify the major organ(s) in each abdominal quadrant.

- a. RUQ-right upper quadrant-liver, gallbladder, right kidney
- b. RLQ-right lower quadrant-cecum, appendix, right ovary
- c. LUQ-left upper quadrant-spleen, stomach, left kidney
- d. LLQ-lower left quadrant-left ovary

**Standard 8**

Examine the relationship between homeostasis and stress.

**Standard 9**

Differentiate between negative and positive mechanisms. Give examples of each.

- a. Be able to describe the following:
  - Childbirth
  - Breast feeding
  - Blood clotting

**Strand 2**

**BASIC PRINCIPLES OF BODY CHEMISTRY -(Students will explain basic principles of body chemistry).**

**Standard 1**

Review the following terms and concepts.

- a. States of Matter
- b. Elements
- c. Basic components of the atom
  - Nucleus
  - Electrons
  - Protons
  - Neutrons

- d. Ion
  - o Electrolyte

**Standard 2**

Identify the four major elements in the body.

- a. Carbon
- b. Hydrogen
- c. Oxygen
- d. Nitrogen

**Standard 3**

Differentiate between:

- a. Compound
- b. Molecule

**Standard 4**

Differentiate between:

- a. Cation
- b. Anion

**Standard 5**

Describe the characteristics of bonds. (no longer place any emphasis on which is the strongest type)

- a. Ionic
- b. Covalent
- c. Hydrogen

**Standard 6**

Define pH.

**Standard 7**

Categorize the following based on the pH of a solution:

- a. Acidic
- b. Basic
- c. Neutral

**Standard 8**

Distinguish between "neutral" pH and the "average" pH range of the blood.

- a. Neutral pH=7.0
- b. Average pH of blood=7.35 to 7.45

**Standard 9**

Describe the properties of water and how it is utilized in the human body.

- a. Universal solvent
- b. Transport
- c. Lubricant
- d. Heat capacity
- e. Chemical reactions

### Standard 10

Distinguish between:

- a. Inorganic compounds-do not contain carbon, small molecules, usually form ionic bonds
- b. Organic compounds-usually contain carbon, large molecules, form covalent bonds, flammable

### Standard 11

Describe the structures and functions of the following and give an example of each:

- a. Carbohydrates
- b. Proteins
- c. Lipids
- d. Nucleic acids
  - RNA
  - DNA
- e. Amino acids

### Standard 12

Describe how the body produces energy during cellular respiration.

- a.  $ATP \leftrightarrow ADP + P + ENERGY$

## Strand 3

**CELLS -(Students will describe basic concepts of structures and functions of cells).**

### Standard 1

Identify the four principle parts of a generalized animal cell and their functions.

- a. Nucleus
- b. Cytosol
- c. Organelles
- d. Cell membrane

### Standard 2

Describe the structure and function of the cell membrane.

### Standard 3

Describe a selectively permeable membrane and factors which influence permeability.

### Standard 4

Contrast intracellular and extracellular fluid in terms of location and composition.

### Standard 5

Describe each of the following cellular transport processes and classify them as active or passive.

- a. Passive processes
  - Diffusion
  - Osmosis
  - Facilitated diffusion
  - Dialysis
  - Filtration

- b. Active processes
  - Phagocytosis
  - Exocytosis
  - Active transport

### Standard 6

Review the osmotic effects that occur when a cell is placed in the following:

- a. Isotonic solution
- b. Hypotonic solution
- c. Hypertonic solution

### Standard 7

Describe the function of the following structures within the cell.

- a. Nucleolus
- b. DNA
- c. RNA
- d. Gene
- e. Chromatin
- f. Chromosome
- g. Ribosomes
- h. Rough endoplasmic reticulum
- i. Smooth endoplasmic reticulum
- j. Golgi complex
- k. Vesicle (vacuole)
- l. Lysosomes
- m. Peroxisomes
- n. Mitochondria
- o. Cytoskeleton
  - Microfilaments
  - Intermediate filaments
  - Microtubules
- p. Centrosomes
- q. Centrioles
- r. Cellular surface variants
  - Microvilli (absorption)
  - Cilia (transports products along the surface of the cell, "crowd surfers")
  - Flagella (transports the cell)

### Standard 8

Compare and contrast:

- a. Mitosis
- b. Meiosis

## **Strand 4**

**HISTOLOGY & INTEGUMENTARY SYSTEM-** (Students will describe basic concepts of structures and functions of histology, and the integumentary system).

### **Standard 1**

Identify the general characteristics and functions of each of the four principle types of tissues.

- a. Epithelial-strategies for tissue identification (arrangement & cell shape)
- b. Connective-adipose, cartilage, dense fibrous, blood, bone
- c. Muscular-skeletal, smooth, cardiac
- d. Nervous

### **Standard 2**

Contrast the following:

- a. Exocrine glands
- b. Endocrine glands

### **Standard 3**

Differentiate between the four basic types of membranes.

- a. Mucous
- b. Serous
- c. Synovial
- d. Cutaneous

### **Standard 4**

Describe the structures and functions of the integumentary system components.

- a. Skin
- b. Glands
- c. Hair
- d. Nails

### **Standard 5**

Describe the major layers of skin.

- a. Epidermis
- b. Dermis
- c. Subcutaneous (hypodermis)

### **Standard 6**

Describe the functions of the following:

- a. Sudoriferous (sweat) glands
- b. Sebaceous (oil) glands

**Standard 7**

Identify the following diseases and disorders of the integumentary system.

- a. Skin cancers
  - Basal cell carcinoma
  - Squamous cell carcinoma
  - Malignant melanoma
- b. Decubitus ulcers
- c. Eczema
- d. Lesion
- e. Burns
  - 1st degree
  - 2nd degree
  - 3rd degree

## Strand 5

**SKELETAL SYSTEM-** (Students will describe the structures and functions of the skeletal system and its components).

### Standard 1

Identify the general functions of the skeletal system.

### Standard 2

Identify the roles of the following in bone growth and ossification:

- a. Osteoblasts
- b. Osteocytes
- c. Osteoclasts

### Standard 3

Describe the features of a long bone.

- a. Periosteum
- b. Diaphysis
- c. Epiphysis
- d. Medullary cavity
- e. Red marrow
- f. Yellow marrow
- g. Articular cartilage
- h. Endosteum
- i. Compact bone
- j. Spongy bone

### Standard 4

Identify the four shapes of bones with characteristics and examples of each.

- a. Long
- b. Short
- c. Flat
- d. Irregular

### Standard 5

Describe and locate the following bone markings.

- a. Foramen
- b. Meatus
- c. Sinus
- d. Fossa
- e. Condyle
- f. Tuberosity
- g. Trochanter
- h. Tubercle
- i. Process

### Standard 6

Describe and differentiate between the following terms:

- a. Suture

- b. Fontanel

**Standard 7**

Contrast the axial and appendicular skeletons.

**Standard 8**

Locate the following bones.

- a. Mandible
- b. Maxilla
- c. Zygomatic
- d. Frontal
- e. Parietal
- f. Occipital
- g. Sphenoid
- h. Ethmoid
- i. Hyoid
- j. Temporal
- k. Clavicle
- l. Scapula
- m. Sternum
- n. Ribs
- o. Pubic bone
  - o. Ilium, Ischium, Pubis
- p. Femur
- q. Patella
- r. Tibia
- s. Fibula
- t. Tarsals
- u. Metatarsals
- v. Phalanges
- w. Humerus
- x. Ulna
- y. Radius
- z. Carpals
- aa. Metacarpals
- bb. Vertebrae

**Standard 9**

Contrast the average number, location, and function of each of the five groups of vertebrae.

- a. Cervical
- b. Thoracic
- c. Lumbar
- d. Sacral
- e. Coccygeal

**Standard 10**

Explain the structural and functional classifications of articulations.

- a. Fibrous
- b. Synovial

- c. Cartilaginous
- d. Amphiarthrotic
- e. Diarthrotic
- f. Synarthrotic

**Standard 11**

Differentiate between ligaments and tendons.

**Standard 12**

Identify the following diseases and disorders of the skeletal system.

- a. Herniated disk
- b. Osteoarthritis
- c. Osteoporosis
- d. Scoliosis
- e. Kyphosis
- f. Lordosis
- g. Spina bifida
- h. RA (Rheumatoid arthritis)

## **Strand 6**

**MUSCULAR SYSTEM-** (Students will describe the structures and functions of the muscular system and its components).

**Standard 1**

Identify the general functions of the muscular system.

**Standard 2**

Describe the four characteristics of muscle tissue.

- a. Elasticity
- b. Excitability (irritability)
- c. Extensibility
- d. Flexibility

**Standard 3**

Contrast the general location, microscopic appearance, control, and functions of the three specific types of muscle tissue.

- a. Skeletal
- b. Smooth
- c. Cardiac

**Standard 4**

Contrast thick and thin myofilaments.

- a. Actin
- b. Myosin

**Standard 5**

Describe the sliding-filament theory of muscle contraction.

**Standard 6**

Describe what occurs at the neuromuscular junction.

**Standard 7**

Define the following terms:

- a. Origin
- b. Insertion

**Standard 8**

Explain the role of the following:

- a. Prime movers (agonists)
- b. Antagonists
- c. Synergist
- d. Fixators

**Standard 9**

Describe the locations and functions of the following skeletal muscles:

- a. Biceps brachii
- b. Triceps brachii
- c. Brachialis
- d. Flexors
- e. Extensors
- f. Pronator
- g. Supinator
- h. Rotator cuff
  - o Supraspinatus
  - o Infraspinatus
  - o Teres minor
  - o Subscapularis
- i. Sternocleidomastoid
- j. Trapezius
- k. Deltoid
- l. Diaphragm
- m. Rectus abdominis
- n. Pectoralis major
- o. Latissimus dorsi
- p. External oblique
- q. Gastrocnemius
- r. Tibialis anterior

- s. Soleus
- t. Hamstrings
  - Semimembranosus
  - Semitendinosus
  - Biceps femoris
- u. Quadriceps
  - Rectus femoris
  - Vastus lateralis
  - Vastus medialis
  - Vastus intermedius
- v. Gluteus maximus
- w. Gluteus medius
- x. Sartorius
- y. Gracilis
- z. Masseter

**Standard 10**

Identify the following diseases and disorders of the muscular system.

- a. Fibromyalgia
- b. Muscular dystrophy
- c. Medial tibial stress syndrome
- d. Compare and contrast the following, describe the three degrees of injury:
  - Sprain
  - Strain

## Strand 7 Part 1

**SPECIAL SENSES** -(Students will describe the structures and functions of special senses).

### Standard 1

Describe the principle anatomical structures of the eye.

- a. Accessory structures
  - Eyelid
  - Conjunctiva
  - Lacrimal apparatus
  - Extrinsic muscles
- b. Layers of the eyeball
  - Fibrous tunic
    - Sclera
    - Cornea
  - Vascular tunic
    - Choroid
    - Ciliary body
    - Iris
    - Lens
    - Pupil
  - Nervous tunic
    - Retina

### Standard 2

Describe the principle anatomical structures of the ear.

- a. Outer ear
  - Auricle
  - Auditory canal
- b. Middle ear
  - Tympanic cavity
  - Tympanic membrane
  - Auditory (Eustachian) tube
  - Auditory ossicles
    - Malleus
    - Incus
    - Stapes
  - Inner ear
    - Bony labyrinth

- Membranous labyrinth
- Semicircular canals
- Vestibule
- Cochlea

### **Standard 3**

Identify the following diseases and disorders associated with special senses.

- a.     Ametropia-abnormal refracted light
  - Myopia
  - Hyperopia
  - Presbyopia
- b.     Cataracts
- c.     Conjunctivitis
- d.     Strabismus
- e.     Glaucoma
- f.     Macular degeneration
- g.     Vertigo
- h.     Tinnitus
- i.     Middle ear infection (Otitis Media)
- j.     Deafness
  - Conductive
  - Sensorineural

**NERVOUS SYSTEM- (Students will describe the structures and functions of the nervous system).**

**Standard 1**

Restate the three broad functions of the nervous system.

- a. Sensory
- b. Integration
- c. Motor

**Standard 2**

Describe the general organization of the nervous system.

- a. Central Nervous System (CNS)
  - o Spinal nerves
    - 31 pairs
  - o Cranial nerves
    - I-XII
  - o Subdivisions
    - Autonomic Nervous System (ANS)
      - Sympathetic
      - Parasympathetic
    - Somatic Nervous System

**Standard 3**

List the functions and structures of neurons and neuroglial cells.

- a. Neuron
- b. Astrocytes
- c. Microglia
- d. Oligodendrocytes
- e. Ependymal cells
- f. Schwann cells
- g. Satellite cells

**Standard 4**

Contrast white and gray matter of nervous tissue.

**Standard 5**

Describe the location and function of CSF.

- a. Ventricles
  - o Choroid Plexus
- b. Subarachnoid space

**Standard 6**

Identify the structures responsible for the maintenance and protection of the central nervous system.

- a. Meninges
  - o Dura mater
  - o Arachnoid mater
  - o Pia mater

**Standard 7**

Identify the four principle parts of the brain.

- a. Cerebrum
- b. Cerebellum
- c. Brain stem
- d. Diencephalon

**Standard 8**

Describe the functions of the three structures of the brain stem.

- a. Medulla oblongata
- b. Pons
- c. Midbrain

**Standard 9**

Describe the structures and functions of the diencephalon.

- a. Thalamus
- b. Hypothalamus

**Standard 10**

Describe the locations and functions of the four lobes of the cerebrum.

- a. Frontal
- b. Parietal
- c. Temporal
- d. Occipital

**Standard 11**

Explain the major functions of the cerebellum.

**Standard 12**

Sequence the major events when the nerve impulse (action potential) is initiated and transmitted through a neuron.

- a. All or None Principle

**Standard 13**

Explain the role of each of the components of a reflex arc.

- a. Reflex
- b. Reflex arc
- c. Receptor
- d. Sensory neuron
- e. Association (interneuron) neuron
- f. Motor neuron
- g. Effector

**Standard 14**

Identify the following diseases and disorders of the nervous system.

- a. ALS

- b. Alzheimer's
- c. Bacterial meningitis
- d. Cerebral palsy
- e. Epilepsy
- f. Multiple sclerosis
- g. Guillain-Barre syndrome
- h. Parkinson's
- i. Cerebral Vascular Accident (CVA)-stroke

## **Strand 8**

**ENDOCRINE SYSTEM -)Students will describe the structures and functions associated with the endocrine system).**

### **Standard 1**

Identify the general functions of the endocrine system.

### **Standard 2**

Describe a "hormone" and how it functions in the body.

### **Standard 3**

Describe the locations, secretions, and functions of the major endocrine glands. Know the hormones and their target.

- a. Hypothalamus
  - o Growth Hormone Releasing Hormone (GHRH)-targets anterior pituitary
  - o Thyrotropin Releasing Hormone (TRH)-targets anterior pituitary
  - o Corticotropin Releasing Hormone (CRH)-target anterior pituitary
  - o Antidiuretic Hormone (ADH)

- Produced in hypothalamus
      - Stored in posterior pituitary
    - Oxytocin Hormone (Oxt)
      - Produced in hypothalamus
      - Stored in posterior pituitary
  - b. Pituitary Gland-found in the hypophyseal fossa "Sella Turcica"
    - Anterior Pituitary (adenohypophysis)
      - Human Growth Hormone (HGH)
        - Targets cells stimulating growth
      - Thyroid Stimulating Hormone (TSH)
        - Targets thyroid gland
      - Adrenocorticotrophic Hormone (ACTH)
        - Targets adrenal cortex
    - Posterior Pituitary (neurohypophysis)
      - Antidiuretic Hormone (ADH)
        - Neural stimulus releases ADH to target kidneys for water retention
      - Oxytocin Hormone (Oxt)
        - Neural stimulus releases Oxt to target uterus for child birthing
        - Neural stimulus releases Oxt to target breast tissue for milk letdown
  - c. Thyroid Gland-found inferior to the Larynx
    - Thyroxine (T4)
      - Targets cells increasing metabolism
    - Triiodothyronine (T3)
      - Targets cells increasing metabolism
  - d. Adrenal Gland-found atop the kidneys
    - Adrenal Cortex
      - Adrenocorticotrophic Hormone (ACTH)
        - Stimulates the release of cortisol
      - Cortisol
        - Anti-inflammatory by suppressing white blood cells
    - Adrenal Medulla-sympathetic stimulus for sustained "Fight or Flight"
      - Epinephrine-adrenaline increasing cell metabolism
      - Norepinephrine-noradrenaline increasing cell metabolism
  - e. Pancreas Gland-Exocrine/Endocrine gland in LUQ posterior to the stomach
    - Insulin
      - Released from Beta cells to target cells to decrease blood sugar
    - Glucagon
      - Released from Alpha cells to break down glycogen to increase blood sugar

#### **Standard 4**

Identify the following diseases and disorders of the endocrine system.

- a. Dwarfism
- b. Gigantism
- c. Acromegaly

- d. Hypothyroidism
  - Myxedema
  - Cretinism-congenital hypothyroidism
- e. Hyperthyroidism (Graves' disease)
  - Goiter
  - Exophthalmos
- f. Diabetes mellitus
  - Type I
  - Type II
- g. Diabetes insipidus
- h. Cushing's syndrome

## Strand 9

**BLOOD -(Students will describe the components and functions associated with blood).**

### Standard 1.

Identify the components of blood and their functions.

- a. Erythrocytes
- b. Leukocytes
- c. Thrombocytes
- d. Plasma

### Standard 2

Describe erythrocytes, including the structure of hemoglobin.

### Standard 3

Define leukocyte and list the two major groups with their cell types and their function.

- a. Granulocytes
  - Neutrophils
  - Basophils
  - Eosinophils
- b. Agranulocytes
  - Monocytes
  - Lymphocytes

### Standard 4

Describe the process of hemostasis.

- a. Vascular spasm
- b. Platelet plug formation
- c. Coagulation

### Standard 5

Contrast a thrombus and an embolus.

**Standard 6**

Identify the antigens found on the erythrocytes and the antibodies that determine the ABO blood types and the Rh factor.

**Standard 7**

Identify the following diseases and disorders associated with the blood.

- a. Anemias
- Nutritional
  - Pernicious
  - Hemorrhagic
  - Hemolytic
  - Sickle cell
  - Aplastic
  - Hemolytic disease of the newborn
  - Hemophilia
  - Leukemia
  - Mononucleosis
  - Polycythemia

**Strand 10**

**LYMPHATIC SYSTEM** -(Students will describe the structures and functions of the lymphatic system).

**Standard 1**

Identify the components of the lymphatic system.

- a. Tonsils
- b. Spleen
- c. Thymus
- d. Lymph nodes

- e. Bone marrow
- f. Lymph vessels

**Standard 2**

Describe how lymph is moved through the body.

**Standard 3**

Contrast antigens and antibodies.

**Standard 4**

Describe the general roles of T-cells and B-cells in the immune response.

**Standard 5**

Distinguish between active and passive immunity and natural vs. artificial acquisition of immunity.

**Standard 6**

Identify the following diseases and disorders associated with the lymphatic system.

- a. AIDS
- b. Measles
- c. Mumps
- d. Rubella
- e. Tetanus

## **Strand 11**

**CARDIOVASCULAR SYSTEM -(Students will describe the structures and functions of the cardiovascular system).**

**Standard 1**

List the general functions of the cardiovascular system.

**Standard 2**

Describe the layers of the heart.

- a. Epicardium
- b. Myocardium
- c. Endocardium

**Standard 3**

Identify the chambers of the heart.

- a. Atria
- b. Ventricles

**Standard 4**

Locate the great blood vessels of the heart.

- a. Superior vena cava
- b. Inferior vena cava
- c. Pulmonary trunk
- d. Pulmonary arteries
- e. Pulmonary veins
- f. Aorta
- g. Branches of the aorta

**Standard 5**

Identify the valves of the heart.

- a. Tricuspid
- b. Pulmonary semilunar
- c. Bicuspid (mitral)
- d. Aortic semilunar

**Standard 6**

Trace blood flow through the heart.

**Standard 7**

Identify the components of the conduction system of the heart and trace the pathway.

- a. SA node
- b. AV node
- c. AV bundle
- d. Bundle branches
- e. Purkinje fibers

**Standard 8**

Sequence the principle events of the cardiac cycle in terms of systole and diastole.

**Standard 9**

Define cardiac output and identify factors that influence it.

- a. Heart rate
- b. Stroke volume

**Standard 10**

Contrast the structures and functions of arteries, capillaries, and veins.

**Standard 11**

Define pulse and identify the general location of arteries where pulse may be felt.

**Standard 12**

Describe blood pressure and how to measure it.

**Standard 13**

Contrast pulmonary and systemic circulation.

**Standard 14**

Identify the following diseases and disorders of the cardiovascular system.

- a. Aneurysm
- b. Arteriosclerosis
- c. Atherosclerosis
- d. Cerebrovascular accident/stroke
- e. Coronary artery disease
- f. Hypertension
- g. Murmur
- h. Myocardial infarction

## **Strand 12**

**RESPIRATORY SYSTEM** -(Students will describe the structures and functions associated with the respiratory system).

### **Standard 1**

Identify the general functions of the respiratory system.

### **Standard 2**

Sequence the organs of the respiratory system in the order in which air will pass through them from the exterior.

### **Standard 3**

Identify the three regions of the pharynx.

- a. Nasopharynx
- b. Oropharynx
- c. Laryngopharynx

### **Standard 4**

Identify the following anatomical features of the larynx.

- a. Epiglottis
- b. Glottis
- c. Hyoid bone
- d. Thyroid cartilage
- e. Cricoid cartilage
- f. True vocal cords
- g. False vocal cords

### **Standard 5**

Identify the coverings of the lungs and the gross anatomical features of the lungs.

- a. Apex
- b. Base
- c. Lobes
- d. Visceral pleura
- e. Parietal pleura
- f. Pleural cavity

### **Standard 6**

Identify the site at which gas exchange occurs in the lungs (alveoli).

**Standard 7**

Identify the volumes and capacities of air exchanged during ventilation.

- a. Vital capacity
- b. Tidal volume

**Standard 8**

Differentiate between the following.

- a. Ventilation
- b. External respiration
- c. Internal respiration

**Standard 9**

Describe the effects of carbon dioxide on ventilation.

**Standard 10**

Identify the following diseases or disorders of the respiratory system.

- a. Chronic Obstructive Pulmonary Disorder
  - o Emphysema
- b. Influenza
- c. Lung cancer
- d. Pneumonia
- e. SIDS
- f. Tuberculosis
- g. Cystic Fibrosis
- h. Respiratory Syncytial Virus (RSV)
- i. Respiratory distress

**Strand 13**

**DIGESTIVE SYSTEM-** (Students will describe the structures and functions associated with the digestive system).

**Standard 1**

Identify the general functions of the digestive system.

**Standard 2**

Contrast chemical and mechanical digestion.

**Standard 3**

Differentiate between the following.

- a. Alimentary canal structures
  - o Mouth
  - o Pharynx
  - o Esophagus
  - o Stomach
  - o Small intestines
  - o Large intestines
  - o Rectum
  - o Anus

- b. Accessory structures
  - Salivary glands (parotid)
  - Pancreas
  - Gallbladder
  - Liver

**Standard 4**

Describe the functions of saliva and salivary amylase in digestion.

**Standard 5**

Identify the following parts of a typical tooth.

- a. Crown
- b. Neck
- c. Root
- d. Gingiva
- e. Periodontal ligament
- f. Enamel
- g. Dentin
- h. Pulp
- i. Root canal

**Standard 6**

Define the following.

- a. Deglutition
- b. Mastication
- c. Maceration
- d. Segmentation
- e. Peristalsis
- f. Haustral churning

**Standard 7**

Identify the anatomical features of the stomach.

- a. Fundus
- b. Body
- c. Pylorus
- d. Rugae
- e. Cardiac sphincter
- f. Pyloric sphincter

**Standard 8**

Identify the basic components and functions of gastric juice.

- a. Chief cells
  - Pepsinogen
- b. Parietal cells
  - Hydrochloric acid
- c. Goblet cells
  - Mucus

**Standard 9**

Identify the location and digestive functions of the pancreas.

- a. Pancreatic Islets
- b. Acini Cells

**Standard 10**

Describe the function of bile (emulsification).

**Standard 11**

Identify the three sections of the small intestine and describe the functions.

- a. Duodenum
- b. Jejunum
- c. Ileum

**Standard 12**

Identify the structures and sections of the large intestine and describe the functions.

- a. Cecum
- b. Colon
  - o Ascending
  - o Transverse
  - o Descending
  - o Sigmoid
- c. Rectum
- d. Anal canal

**Standard 13**

Identify the following diseases and disorders of the digestive system.

- a. Appendicitis
- b. Cirrhosis
- c. Colorectal cancer
- d. Gallstones
- e. Hepatitis
- f. Obesity
- g. Ulcers
- h. Celiac disease
- i. Crohn's disease
- j. Irritable Bowel Syndrome (IBS)

## **Strand 14**

**URINARY SYSTEM** -(Students will describe the structures and functions associated with the urinary system).

**Standard 1**

Identify the general functions of the urinary system.

**Standard 2**

Identify the four major organs of the urinary system.

- a. Kidneys
- b. Ureters
- c. Bladder
- d. Urethra

**Standard 3**

Identify the gross anatomy of the kidney

- a. Renal cortex
- b. Renal medulla
- c. Renal pyramids
- d. Renal pelvis
- e. Renal capsule
- f. Calyces

**Standard 4**

Identify the microscopic structures of the nephron.

- a. Renal corpuscle
- b. Glomerulus
- c. Glomerular (Bowman's) capsule
- d. Afferent arteriole
- e. Efferent arteriole
- f. Renal tubule
  - o Proximal convoluted tubule
  - o Descending limb
  - o Nephron loop
  - o Ascending limb
  - o Distal convoluted tubule
  - o Collecting duct
- g. Peritubular capillaries

**Standard 5**

Describe the three basic physiological processes and the structures involved in urine formation.

- a. Filtration
- b. Reabsorption
- c. Secretion

**Standard 6**

Identify abnormal constituents of urine and possible causes of each.

- a. Glucose
- b. Ketones
- c. Erythrocytes
- d. Leukocytes
- e. Bilirubin
- f. Microbes
- g. Albumin

**Standard 7**

Describe the methods of fluid intake and output.

- a. Intake
  - Oral
    - Liquid
    - Solid
  - Intravenous
  - Metabolic
- b. Output
  - Micturition
  - Voiding
  - Sweat
  - Feces
  - Exhaled vapor

### **Standard 8**

Identify the following diseases and disorders associated with the urinary system.

- a. Cystitis
- b. Glomerulonephritis
- c. Incontinence
- d. Kidney stones
- e. Polyuria
- f. Renal failure
- g. Urinary tract infections (UTI)

## **Strand 15**

**REPRODUCTIVE SYSTEM -(Students will describe the structures and functions associated with the reproductive system).**

### **Standard 1**

Identify the general functions of the reproductive system.

### **Standard 2**

Describe the anatomy of the male genitalia.

- a. External
  - Penis
  - Scrotum
  - Testes
- b. Internal
  - Epididymis
  - Ductus deferens
  - Ejaculatory duct
  - Urethra
- c. Accessory
  - Seminal vesicles
  - Prostate
  - Bulbourethral gland

### **Standard 3**

Identify the function of the testes.

### **Standard 4**

Identify the functions of testosterone in the male.

**Standard 5**

Describe the anatomy of the female reproductive structures.

- a. External
  - Vulva
  - Labia majora
  - Clitoris
  - Labia minora
  - Mons pubis
  - Vestibule
- b. Internal
  - Ovaries
  - Uterus
  - Uterine tubes
  - Vagina
- c. Accessory
  - Mammary glands
  - Perineum

**Standard 6**

Identify the functions of the ovaries.

**Standard 7**

Identify the structures and functions of the uterine tubes, including fimbriae and infundibulum.

**Standard 8**

Describe the structures and function of the uterus.

- a. Perimetrium
- b. Myometrium
- c. Endometrium
  - Stratum functionalis
  - Stratum basalis
- d. Fundus
- e. Cervix

**Standard 9**

Define the menstrual cycle including the ovarian and uterine cycles and changes that occur during menopause.

**Standard 10**

Describe the physiological effects of estrogens, progesterone and relaxin.

**Standard 11**

Contrast the general outcomes of spermatogenesis vs. oogenesis

**Standard 12**

Define the following sequence of events that occur during human development.

- a. Fertilization
- b. Zygote
- c. Implantation
- d. Embryo

- e. Fetus

**Standard 13**

Identify the principle events associated with the three stages of labor.

- a. Stage 1-dilation and effacement
- b. Stage 2-delivery and birth
- c. Stage 3-placental expulsion

**Standard 14**

Identify the following diseases and disorders of the reproductive system.

- a. Reproductive cancers
  - o Breast
  - o Testicular
  - o Cervical
  - o Ovarian
  - o Prostate
  - o Uterine
- b. Endometriosis
- c. Impotence
- d. Polycystic Ovarian Syndrome
- e. Sexually Transmitted Infections (STI)
  - o Gonorrhea
  - o Syphilis
  - o Genital herpes
  - o Chlamydia
  - o Trichomoniasis
  - o Genital warts
  - o Human Papilloma Virus (HPV)
  - o