

**STRAND 1: INTRODUCTION-Students will explore the fundamental aspects of Healthcare.**

**Standard 1**

Identify how math is used in the medical field.

- Demonstrate use of the 24-hour clock/military time.
- Demonstrate competency in basic math skills as they relate to healthcare (averages, ratios, fractions, percentages, addition, subtraction, multiplication, division).
- Demonstrate the ability to convert units of height, weight, and temperature.
- Demonstrate the ability to use the metric system.

**Standard 2**

Describe anatomical position and the role it plays in human anatomy.

- Define anatomical position.

**Standard 3**

Describe body planes and directional terms and their relationship to anatomical position.

- Identify body planes.
  - Sagittal
  - Mid-sagittal
  - Coronal/frontal
  - Transverse/horizontal
- Identify directional terms.
  - Superior
  - Inferior
  - Anterior
  - Posterior
  - Medial
  - Lateral
  - Proximal
  - Distal
  - Superficial
  - Deep

**STRAND 2: SUPPORT SYSTEMS-Students will explore aspects of the body systems related to support.**

**Standard 1**

Identify the basic functions of the skeletal system.

- Describe how the skeletal system provides structure/support.
- Describe how the skeletal system provides means for muscle attachment and movement.
- Describe how the skeletal system store minerals (i.e., calcium).
- Describe hematopoiesis (blood cell production) and where it occurs.

**Standard 2**

Explore the basic structure of the skeleton.

- Identify the following bones:
  - Cranium
  - Frontal
  - Parietal

- Occipital
- Temporal
- Maxillae
- Mandible
- Vertebrae
- Cervical
- Thoracic
- Lumbar
- Sacrum
- Coccyx
- Ribs
- Sternum
- Humerus
- Radius
- Ulna
- Carpals
- Metacarpals
- Phalanges (fingers)
- Pelvis
- Femur
- Patella
- Tibia
- Fibula
- Tarsals
- Metatarsals
- Phalanges (toes)
- Describe articulation and identify examples of the following:
  - Immovable
  - Movable
- Describe the function of ligaments.

### **Standard 3**

Describe the diseases and disorders associated with the skeletal system.

- Compare and contrast open and closed fractures.
- Describe the causes, signs, symptoms, and treatment of scoliosis.
- Describe the causes, signs, symptoms, and treatment of osteoarthritis.
- Describe the causes, signs, symptoms, and treatment of osteoporosis.
- Describe the causes, signs, symptoms, and treatment of sprain.

### **Standard 4**

Describe the basic functions of the muscular system.

- Define thermogenesis.
- Identify how muscles produce movement (i.e., muscle contractions).
- Explain how muscles maintain posture.
- Explain how muscles protect internal organs.
- Explain how smooth muscle controls the volume of hollow body organs.

**Standard 5**

Explore the basic structure of the muscular system.

- Differentiate between cardiac, smooth, and skeletal muscles (appearance, location, control)
- Identify the location of the following muscles:
  - Biceps Brachii
  - Triceps Brachii
  - Trapezius
  - Deltoid
  - Diaphragm
  - Pectoralis major
  - Latissimus dorsi
  - Rectus abdominis
  - Gastrocnemius
  - Hamstrings
  - Quadriceps
  - Gluteus maximus
- Describe the function of tendons

**Standard 6**

Describe the disease and disorders associated with the muscular system.

- Describe the causes, signs, symptoms, and treatment of tendonitis.
- Describe the causes, signs, symptoms, and treatment of muscular dystrophy.
- Describe the causes, signs, symptoms, and treatment of strain.
- Describe the causes, signs, symptoms, and treatment of spasm (i.e., Charlie horse).

**Standard 7**

Describe the basic functions of the integumentary system.

- Identify how skin protects against infection.
- Explain that the skin produces vitamin D.
- Explain how the skin functions as a sensory organ.
- Explain how skin regulates body temperature.
- Identify how the skin protects against UV light.

**Standard 8**

Identify the layers of the skin and appendages.

- Describe the layers of the skin.
  - Epidermis
  - Dermis
  - Hypodermis (Subcutaneous)
- Describe the appendages of the skin.
  - Nails
  - Sudoriferous (sweat) glands
  - Sebaceous (oil) glands
  - Hair

**Standard 9**

Describe the disease and disorders associated with the integumentary system.

- Describe the causes, signs, symptoms, and treatment of acne.

- Describe the causes, signs, symptoms, and treatment of mycoses (fungal infections) (i.e., athlete's foot,
- Describe the causes, signs, symptoms, treatment, prevention, and detection (ABCDE method) of skin cancer.
- Basal cell carcinoma
- Squamous cell carcinoma
- Melanoma

**STRAND 3: TRANSPORTATION SYSTEMS-Students will explore aspects of the body systems related to transportation.**

**Standard 1**

Describe the basic functions of the cardiovascular system.

- Identify how the cardiovascular system transports nutrients and wastes.
- Identify how the cardiovascular system transports heat.
- Identify how the cardiovascular system transports oxygen to body cells and carbon dioxide away from body
- Identify how the cardiovascular system transports hormones.
- Identify how the cardiovascular system transports antibodies.

**Standard 2**

Identify the basic structures and functions of the heart, blood vessels, and blood.

- Describe the basic structures and functions of the heart.
- Right atrium
- Right ventricle
- Left atrium
- Left ventricles
- Valves
- Explain the flow of blood through the heart.
- Compare and contrast the difference between arteries, capillaries, and veins.
- Identify the components of blood and the function of each component.
- Red blood cells
- White blood cells
- Platelets
- Plasma

**Standard 3**

Describe the diseases and disorders associated with the circulatory system.

- Describe the causes, signs, symptoms, and treatment of atherosclerosis.
- Describe the causes, signs, symptoms, and treatment of hypertension.
- Describe the causes, signs, symptoms, and treatment of myocardial infarction.
- Describe the causes, signs, symptoms, and treatment of anemia.

**Standard 4**

Identify the basic functions of the respiratory system.

- Describe how the nose warms, moistens, and filters air.
- Describe how sound production is related to the respiratory system.
- Describe the process of carbon dioxide-oxygen gas exchange.

**Standard 5**

Describe the basic function and structures of the respiratory system.

- Nasal cavity

- Oral cavity
- Pharynx
- Epiglottis
- Larynx
- Trachea
- Bronchi
- Bronchioles
- Lungs
- Alveoli

#### **Standard 6**

Describe the diseases and disorders associated with the respiratory system.

- Describe the causes, signs, symptoms, and treatment of pneumonia.
- Describe the causes, signs, symptoms, and treatment of lung cancer.
- Describe the causes, signs, symptoms, and treatment of tuberculosis.
- Describe the causes, signs, symptoms, and treatment of influenza.
- Describe the causes, signs, symptoms, and treatment of Chronic Obstructive Pulmonary Disorders (COPD).
- Asthma
- Chronic bronchitis
- Emphysema

#### **Standard 7**

Describe the basic function and structures of the immune system.

- Identify the basic function of the immune system (provides protection against diseases).
- Identify the basic structures of the immune system.
- Tonsils
- Lymph nodes
- Spleen
- White blood cells

#### **Standard 8**

Describe the diseases and disorders associated with the immune system.

- Describe the causes, signs, symptoms, and treatment of the human immunodeficiency virus (HIV).
- Describe the causes, signs, symptoms, and treatment of acquired immune deficiency syndrome (AIDS).
- Describe the causes, signs, symptoms, and treatment of lupus.
- Describe the causes, signs, symptoms, and treatment of mononucleosis.

### **STRAND 4: REGULATORY SYSTEMS-Students will explore aspects of the body systems related to regulation.**

#### **Standard 1**

Identify the basic functions of the nervous system.

- Describe how the sensory nerves detect stimuli (pressure, temperature, taste, smell, light, etc.) and send the message in the form of an impulse to the central nervous system (spinal cord/brain).
- Describe how the nervous system receives and interprets incoming nerve impulses and determines appropriate responses.
- Explain how the motor nerves carry out the response of the central nervous system (spinal cord/brain).

#### **Standard 2**

Identify the basic structures and their functions.

- Describe the structures of the brain and their functions.
  - Cerebrum
  - Cerebellum
  - Brain stem
- Describe the structure and function of the spinal cord.
- Describe the location and function of cerebrospinal fluid.
- Describe the location and function of meninges.
- Describe the structure (cell body, dendrites, axon) and function of sensory and motor nerves.

### **Standard 3**

Describe the diseases and disorders associated with the nervous system.

- Describe the causes, signs, symptoms, and treatment of meningitis.
- Describe the causes, signs, symptoms, and treatment of epilepsy.
- Describe the causes, signs, symptoms, and treatment of concussion.
- Describe the causes, signs, symptoms, and treatment of cerebrovascular accident (stroke).

### **Standard 4**

Describe the receptors of the special senses.

- Identify the sense of smell (chemoreceptors).
- Identify the sense of taste (chemoreceptors).
- Identify the sense of hearing (mechanoreceptors).
- Identify the sense of vision (photoreceptors).
- Identify the sense of touch (mechanoreceptors).

### **Standard 5**

Identify the basic structures of the special sense organs and their functions.

- Describe the structure and function of the ear.
  - Outer ear
    - Auricle/Pinna
    - External auditory canal
  - Middle ear
    - Tympanic membrane
    - Auditory/Eustachian tube
    - Auditory ossicles
      - Malleus
      - Incus
      - Stapes
  - Inner ear
    - Cochlea
- Describe the structure and function of the eye.
  - Eyelid
  - Conjunctiva
  - Sclera
  - Cornea
  - Iris
  - Pupil
  - Lens

- Retina
- Describe the structure and function of the nose (olfactory receptors).
- Describe the structure and function of the mouth/tongue (taste buds).
- Describe the structure and function of the skin (nerve endings).

#### **Standard 6**

Describe the diseases and disorders of the special senses.

- Describe the causes, signs, symptoms, and treatment of pinkeye (conjunctivitis).
- Describe the causes, signs, symptoms, and treatment of middle ear infection (otitis media).
- Describe the causes, signs, symptoms, and treatment of deafness.
- Describe the causes, signs, symptoms, and treatment of near-sightedness (myopia).
- Describe the causes, signs, symptoms, and treatment of far-sightedness (hyperopia).
- Describe the causes, signs, symptoms, and treatment of aging eyes (presbyopia).

#### **Standard 7**

Identify the basic functions of the endocrine system.

- Describe how the endocrine system regulates body processes.
- Describe how the endocrine system regulates growth, development, and maturation.

#### **Standard 8**

Identify the location of the following glands and the function of the hormones they release.

- Pituitary gland-located in the brain, releases growth hormone (GH), thyroid stimulating hormone (TSH), and adrenocorticotrophic hormone (ACTH).
- Thyroid gland-located in the neck, releases thyroxine.
- Pancreas-located behind the stomach, releases insulin and glucagon.
- Adrenal glands-located on top of the kidneys, releases cortisol, adrenaline, and noradrenaline.

#### **Standard 9**

Describe the disease and disorders of the endocrine system.

- Describe the causes, signs, symptoms, and treatment of Type 1 diabetes (Insulin Dependent Diabetes Mellitus).
- Describe the causes, signs, symptoms, and treatment of Type 2 diabetes (Non-insulin Dependent Diabetes).
- Describe the causes, signs, symptoms, and treatment of gigantism.
- Describe the causes, signs, symptoms, and treatment of dwarfism.
- Describe the causes, signs, symptoms, and treatment of hypothyroidism.
- Describe the causes, signs, symptoms, and treatment of hyperthyroidism.

### **STRAND 5: MAINTENANCE SYSTEMS-Students will explore aspects of the body systems related to maintenance.**

#### **Standard 1**

Describe the basic functions of the digestive system.

- Define ingestion.
- Define digestion (chemical and mechanical).
- Define absorption.
- Define excretion.

#### **Standard 2**

Describe the location and basic functions of the digestive organs.

- Mouth, chemical and mechanical digestion
- Pharynx, passageway
- Esophagus, passageway

- Stomach-storage, absorption, chemical and mechanical digestion
- Small intestine, chemical digestion and absorption
- Large intestine, absorption of water and formation of feces
- Rectum, temporary storage for solid waste (feces)
- Anus, excretion of feces

### **Standard 3**

Describe the diseases and disorders of the digestive system.

- Describe the causes, signs, symptoms, and treatment of Crohn's disease.
- Describe the causes, signs, symptoms, and treatment of celiac disease.
- Describe the causes, signs, symptoms, and treatment of appendicitis.
- Describe the causes, signs, symptoms, and treatment of colon cancer.

### **Standard 4**

Describe the basic functions of the urinary system.

- Explain how the urinary system regulates the volume and composition of blood.
- Explain how the urinary system excretes body wastes.

### **Standard 5**

Identify the basic organs, and functions of the urinary system.

- Kidneys, filter blood and produce urine
- Ureters, transport urine from the kidney to the bladder
- Bladder, storage of urine
- Urethra, transport urine from bladder to the exterior of the body

### **Standard 6**

Describe the diseases and disorders of the urinary system

- Describe the causes, signs, symptoms, and treatment of kidney stones.
- Describe the causes, signs, symptoms, and treatment of kidney failure.
- Describe the causes, signs, symptoms, and treatment of urinary tract infections (UTI).

## **STRAND 6: REPRODUCTIVE SYSTEM-Students will explore aspects of the human reproductive system.**

### **Standard 1**

Describe the functions of the reproductive system.

- Explain the production of gametes (egg and sperm) by the gonads.
- Explain the production of hormones to help in the maturation process.

### **Standard 2**

Describe the structures, location and function of the female reproductive system.

- Ovaries, produces and releases the egg (ovulation) and releases estrogen and progesterone.
- Uterine tubes, tube for the eggs to travel to the uterus, most common site for fertilization of the egg
- Uterus, consists of the fundus, body, and cervix, site for menstruation (endometrium), development of the embryo, and expulsion of the fetus
- Vagina, passageway for menstruation, female copulatory organ, birth canal

### **Standard 3**

Describe the structures, location and function of the male reproductive system.

- Testes, produces sperm and testosterone
- Scrotum, encloses and protects the testes and maintains an optimal temperature for sperm production
- Epididymis, storage and maturation of sperm



- Vas Deferens, transportation of sperm
- Prostate gland, secretes alkaline fluid
- Urethra, passageway for sperm and urine

#### **Standard 4**

Describe the diseases and disorders of the reproductive system.

- Describe the causes, signs, symptoms, and treatment of endometriosis.
- Describe the causes, signs, symptoms, and treatment of cervical cancer.
- Describe the causes, signs, symptoms, and treatment of benign prostatic hypertrophy.
- Describe the causes, signs, symptoms, and treatment of testicular cancer.
- Describe the causes, signs, symptoms, and treatment of sexually transmitted infections (STI/STD).

### **STRAND 7: INTRODUCTION-Students will explore the organizational aspects of Healthcare.**

#### **Standard 1**

Compare and contrast the history of medicine with current trends.

- Describe the contribution(s) to healthcare that the following groups or individuals have made.
  - Egyptians
  - Hippocrates
  - Clara Barton
  - Florence Nightingale
  - William Harvey
  - Joseph Lister
  - Ignas Semmelweis
- Identify current trends in healthcare.

#### **Standard 2**

Investigate the various aspects of health insurance.

- Describe health insurance.
  - Premium
  - Copay
  - Deductible
- Compare and contrast government funded healthcare programs and private health insurance.
  - Medicaid
  - Medicare

#### **Standard 3**

Summarize basic professional standards and characteristics of healthcare workers.

- Describe proper hygiene of a healthcare worker.
  - Handwashing
- Describe proper dress of a healthcare worker.
- Discuss proper behavior in a healthcare setting (honesty, empathy, dependable, life- long learner, and teamwork).

#### **Standard 4**

Discuss desirable attitudes and behaviors when providing healthcare to diverse patients.

- Describe how cultural differences impart the delivery of healthcare.
- Describe the importance of treating patients as individuals (gender, race, age, religion, etc.).

#### **Standard 5**

Compare and contrast the health science career pathways.

- Explore careers associated with the Diagnostic Services Pathway. Careers associated with the technology used to aid in the diagnosing of patients.
- Explore careers associated with the Therapeutic Services Pathway. Careers that are associated with direct patient care.
- Explore careers associated with the Health Informatics Pathway. Careers associated with the business side of healthcare.
- Explore careers associated with the Support Services Pathway. Careers that create an environment suitable for patient care.
- Explore careers associated with the Biotechnology Research and Development Pathway. Careers that use science and technology that make improvements in the therapeutic and diagnostic arenas.

#### **Standard 6**

Demonstrate knowledge of medical law and medical ethics.

- Differentiate between medical law and medical ethics.
- Describe scope of practice for healthcare workers.
- Explain the importance of expressed consent and implied consent.
- Define legal implications and how they relate to healthcare (battery, invasion of privacy, malpractice/ negligence).
- Describe HIPAA with particular emphasis on patient confidentiality and patient records.

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