



Anatomy & Physiology

Introduction to Human Anatomy & Physiology

Competencies

1.1, 1.2, 4.1 7.1, 7.3, 7.4

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- S1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.3 Explain body planes, directional terms, quadrants, and cavities.
- 4.1 Identify a variety of careers that use anatomy and physiology knowledge and how it related to health careers.
- 7.1 Identify content, skills and technology related to the health science field.
- 7.3 Apply mathematical principles to conversion equations commonly used in health-related fields.
- 7.4 Apply mathematical principles involving temperature, weights, and measures commonly used in health-related fields.

I can

- I*I can define anatomy, physiology, and the anatomical position.
- *I can list the levels of organization of the body beginning at the atomic level.
- *I can differentiate between a negative and positive feedback loop.
- *I can label the body cavities, sections, and membranes, and regions found in the appendicular and axial portion of the body and the subdivisions of each.
- *I can identify the relative positions of the body (superior/inferior, anterior/posterior, medial/lateral, proximal/distal, superficial deep).
- *I can discover the relationship between exercise and body temperature and describe the relationship to homeostasis of the body (negative feed-back loop).

Vocab

Content: Anatomy Physiology Cytology Histology Metabolism Feedback Homeostasis Superior Inferior Lateral Medial Anterior Posterior Proximal Distal Superficial Deep

Academic:*Apply *Analyze *Classify *Describe *Interpret



Anatomy & Physiology Tissues

Competencies

1.1, 1.2, 1.3, 5.1, 6.1, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.3 Explain body planes, directional terms, quadrants, and cavities.
- 5.1 Explain the importance of confidentiality in health care.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 7.1 Identify content, skills and technology related to the health science field.

I can

- *I can identify and classify different types of tissues, including epithelial, connective, muscle, and nervous tissues.
- *I can explain the structure and function of each type of tissue in the human body.
- *I can identify the different cell types present in each type of tissue and describe their roles.
- *I can describe the histological characteristics of tissues, including their appearance under a microscope and their distinguishing features.
- *I can describe the organization of tissues into organs and organ systems, and understand how tissues work together to carry out specific functions.
- *I can identify and describe the major organs and structures associated with each type of tissue.

Vocab

Content: Epithelial tissue Connective tissue Muscle tissue Nervous tissue Histology Cell types (e.g., epithelial cells, fibroblasts, neurons) Extracellular matrix Basement membrane Epidermis Dermis Subcutaneous tissue Scar tissue Regeneration Glands (e.g., sweat glands, sebaceous glands) Organ systems (e.g., respiratory system, digestive system)

Academic: *Collect *Compare *Construct *Explain *Identify *Represent *Use a Model



Anatomy & Physiology

Integumentary System

Competencies

1.1, 1.2, 1.3, 2.1, 6.1, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.

1.2 Compare relationships among cells, tissue, organs, and systems.

1.3 Explain body planes, directional terms, quadrants, and cavities.

2.1 Compare selected diseases/disorders including respective classification(s), causes, diagnoses, therapies, and care/rehabilitation to include biotechnological applications.

6.1 Use personal protective equipment as appropriate to the environment.

7.1 Identify content, skills and technology related to the health science field.

I can

*I can identify the major components of the integumentary system, including the skin, hair, nails, and associated glands.

*I can describe the structure and functions of the different layers of the skin: the epidermis, dermis, and subcutaneous tissue.

*I can explain the role of the integumentary system in protection, sensation, temperature regulation, and excretion.

*I can identify and describe the different types of cells found in the epidermis, such as keratinocytes, melanocytes, and Langerhans cells, and their respective functions.

*I can identify and describe the different types of glands in the integumentary system, such as sweat glands, sebaceous glands, and ceruminous glands, and explain their functions.

*I can explain the role of the integumentary system in vitamin D synthesis and its importance for calcium metabolism.

Vocab

Content: Epidermis Dermis Subcutaneous tissue Keratinocytes Melanocytes Hair follicle Sebaceous glands Sweat glands Ceruminous glands Skin coloration Vitamin D synthesis Wound healing Scar formation Barrier function Thermoregulation

Academic: *Analyze *Compare *Describe *Explain *Explore *Graph *Measure *Test



Anatomy & Physiology

Skeletal System

Competencies

1.1, 1.2, 1.3, 6.1, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.3 Explain body planes, directional terms, quadrants, and cavities.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 7.1 Identify content, skills and technology related to the health science field.

I can

- *I can identify and describe the major bones of the human skeletal system, including their names, locations, and main functions.
- *I can explain the structure and composition of bones, including the different types of bone tissue, such as compact bone and spongy bone, and their respective roles.
- *I can identify and describe the different types of joints in the skeletal system, including fibrous joints, cartilaginous joints, and synovial joints, and understand their range of motion and stability.
- *I can explain the process of bone development and growth, including the roles of ossification, epiphyseal plates, and bone remodeling.
- *I can describe the functions of the skeletal system, including support, protection, movement, mineral storage, and blood cell production.
- *I can explain the roles of different types of bone cells, such as osteoblasts, osteocytes, and osteoclasts, in bone formation, maintenance, and remodeling.

Vocab

Content: Osteoblasts Osteoclasts Osteocytes Compact bone Spongy bone Bone remodeling Epiphyseal plate Bone marrow Cartilage Ligament Tendon Axial skeleton Appendicular skeleton Haversian system (osteon) Fracture

Academic: *Analyze *Compare *Describe *Explain *Explore *Identify *Measure *Represent *Test



Anatomy & Physiology

Muscular System

Competencies

1.1, 1.2, 1.3, 1.4, 6.1, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.3 Explain body planes, directional terms, quadrants, and cavities.
- 1.4 Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 7.1 Identify content, skills and technology related to the health science field.

I can

- *I can identify and describe the major muscles of the human body, including their names, locations, and functions.
- *I can explain the structure and organization of muscles, including the arrangement of muscle fibers, connective tissues, and tendons.
- *I can describe the different types of muscle tissue: skeletal muscle, cardiac muscle, and smooth muscle, and understand their unique characteristics and functions.
- *I can explain the process of muscle contraction, including the role of actin, myosin, and ATP in the sliding filament theory.
- *I can identify and describe the different types of muscle contractions, such as isotonic and isometric contractions, and understand how they contribute to movement and muscle tone.
- *I can explain the role of the neuromuscular junction and the motor unit in transmitting signals from the nervous system to the muscles, leading to muscle contraction.

Vocab

Content: Skeletal muscle Smooth muscle Cardiac muscle Myofibrils Sarcomere Actin Myosin Motor unit Neuromuscular junction Muscle contraction Isotonic contraction Isometric contraction Muscle tone Muscle fatigue Muscle fiber

Academic: *Analyze *Carry out *Communicate *Construct *Describe *Identify *Represent *Use a model



Anatomy & Physiology

Nervous System

Competencies

1.1, 1.2, 1.3, 1.4, 6.1, 6.3

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.3 Explain body planes, directional terms, quadrants, and cavities.
- 1.4 Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 6.3 Prevent accidents by using proper safety techniques for the prevention of accidents.

I can

- *I can identify and describe the major components of the nervous system, including the brain, spinal cord, and peripheral nerves.
- *I can explain the structure and function of neurons, including the different types of neurons and their roles in transmitting electrical and chemical signals.
- *I can describe the organization of the nervous system, including the central nervous system (CNS) and the peripheral nervous system (PNS), and understand their respective functions.
- *I can explain the process of synaptic transmission, including the release and binding of neurotransmitters, and understand how it facilitates communication between neurons.
- *I can identify and describe the major regions and structures of the brain, including the cerebrum, cerebellum, and brainstem, and understand their roles in controlling various bodily functions.
- *I can explain the division of the peripheral nervous system into the somatic nervous system and the autonomic nervous system, and understand their roles in voluntary and involuntary actions, respectively.

Vocab

Content: Neuron , Central nervous system (CNS) , Peripheral nervous system (PNS) , Brain , Spinal cord , Synapse , Neurotransmitter , Action potential , Sensory receptors , Motor neurons , Reflex , Neuroplasticity , Myelin sheath , Autonomic nervous system , Cerebral cortex

Academic: *Analyze *Compare *Construct *Explore *Identify *Represent *Use a model



Anatomy & Physiology

Special Senses

Competencies

1.1, 1.2, 6.1, 6.2, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.

1.2 Compare relationships among cells, tissue, organs, and systems.

6.1 Use personal protective equipment as appropriate to the environment.

6.2 Modify the environment to create safe working conditions. Evaluate and modify the environment to create and maintain safe working conditions.

7.1 Identify content, skills and technology related to the health science field.

I can

*I can identify and describe the major senses in the human body, including vision, hearing, taste, smell, touch, and proprioception.

*I can explain the anatomical structures and physiological processes involved in each sense, such as the role of the eyes, optic nerves, and visual cortex in vision.

*I can describe the specialized sensory receptors associated with each sense, such as photoreceptors in the eyes, taste buds on the tongue, and mechanoreceptors in the skin.

*I can explain how sensory information is transmitted from the sensory receptors to the brain, including the pathways and processing centers involved.

*I can identify and describe common sensory disorders and conditions, such as color blindness, hearing loss, and anosmia (loss of smell), and understand their underlying causes.

*I can explain the concept of sensory adaptation and its role in adjusting the sensitivity of sensory receptors over time, as well as its importance in filtering out irrelevant information and focusing on relevant stimuli.

Vocab

Content: Sensory receptors Stimulus Vision Hearing Taste Smell Touch Proprioception Photoreceptors Mechanoreceptors Chemoreceptors Thermoreceptors Olfactory bulbs Gustatory cortex Sensory adaptation

Academic: *Analyze *Classify *Construct *Design *Identify *Measure *Understand *Use



Anatomy & Physiology

Blood

Competencies

1.1, 1.2, 1.4, 2.2, 2.3, 6.1, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.4 Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.
- 2.2 Analyze methods to control the spread of pathogenic microorganisms.
- 2.3 Analyze body system changes in light of diseases, disorders, and wellness.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 7.1 Identify content, skills and technology related to the health science field.

I can

- *I can identify and describe the components of blood, including red blood cells, white blood cells, platelets, and plasma, and understand their respective roles in the body.
- *I can explain the structure and function of red blood cells, including their role in oxygen and carbon dioxide transport, as well as the importance of hemoglobin.
- *I can identify and describe the different types of white blood cells, including neutrophils, lymphocytes, monocytes, eosinophils, and basophils, and understand their functions in immune defense.
- *I can explain the process of blood clotting, including the roles of platelets and clotting factors, and understand the importance of this mechanism in preventing excessive bleeding.
- *I can describe the different blood types and understand the significance of blood compatibility in transfusions, including the ABO blood group system and Rh factor.
- *I can explain the concept of blood pressure, including how it is measured, the factors influencing it, and the significance of normal blood pressure levels for cardiovascular health.

Vocab

Content: Red blood cells White blood cells Platelets Plasma Hemoglobin Hematopoiesis Erythropoiesis Leukocytes Granulocytes Agranulocytes Coagulation Blood types Rh factor Blood transfusion Blood pressure

Academic: *Analyze *Carry out *Collect *Communicate *Describe *Explain *Identify *Test



Anatomy & Physiology

Heart

Competencies

1.1, 1.2, 1.4, 3.1, 6.1, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.4 Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.
- 3.1 Identify methods to assess vital signs.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 7.1 Identify content, skills and technology related to the health science field.

I can

- *I can identify and describe the structure of the heart, including its chambers (atria and ventricles), valves, and major blood vessels (such as the aorta and vena cava).
- *I can explain the function of the heart as a muscular pump that circulates oxygenated blood to the body and deoxygenated blood to the lungs.
- *I can describe the electrical conduction system of the heart, including the sinoatrial (SA) node, atrioventricular (AV) node, and bundle of His, and understand their roles in coordinating the heart's rhythm and contractions.
- *I can explain the cardiac cycle, including the events of atrial and ventricular contraction (systole) and relaxation (diastole), and understand how these events contribute to blood flow through the heart.
- *I can identify and describe the major blood vessels associated with the heart, including the coronary arteries and cardiac veins, and understand their roles in supplying oxygen and nutrients to the cardiac muscle.
- *I can explain common cardiovascular disorders and conditions, such as coronary artery disease, heart failure, and arrhythmias, and understand their causes, symptoms, and potential treatment options.

Vocab

Content: Atrium Ventricle Valves Cardiac muscle Electrical conduction system Sinoatrial (SA) node Atrioventricular (AV) node Bundle of His Purkinje fibers Coronary arteries Cardiac output Blood circulation Myocardial infarction Heart rate Cardiac cycle

Academic: *Classify *Compare *Describe *Engage *Identify *Interpret *Represent



Anatomy & Physiology

Respiratory System

Competencies

1.1, 1.2, 1.4, 3.1, 6.1, 7.1, 7.5

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.4 Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.
- 3.1 Identify methods to assess vital signs.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 7.1 Identify content, skills and technology related to the health science field.
- 7.5 Analyze diagrams, charts, graphs, and tables to interpret results commonly found in health-related fields.

I can

- **I can identify and describe the major components of the respiratory system, including the nose, pharynx, larynx, trachea, bronchi, and lungs.
- *I can explain the process of respiration, including both external respiration (exchange of gases between lungs and blood) and internal respiration (exchange of gases between blood and body tissues).
- *I can describe the structure and function of the alveoli in the lungs, including their role in gas exchange and the presence of surfactant to reduce surface tension.
- *I can identify and describe the mechanics of breathing, including the roles of the diaphragm and intercostal muscles in inhalation and exhalation.
- *I can explain the control of respiration, including the role of the respiratory centers in the brainstem, as well as the influence of factors such as pH, oxygen, and carbon dioxide levels on respiration rate.
- *I can describe common respiratory disorders and conditions, such as asthma, chronic obstructive pulmonary disease (COPD), and pneumonia, and understand their causes, symptoms, and potential treatment options.

Vocab

Content: Respiration Trachea Bronchi Lungs Alveoli Diaphragm Intercostal muscles Gas exchange Pulmonary ventilation External respiration Internal respiration Surfactant Oxygenation Carbon dioxide elimination Respiratory rate

Academic: *Analyze *Collect *Describe *Explain *Graph *Interpret *Plan *Understand



Anatomy & Physiology

Digestive System

Competencies

1.1, 1.2, 1.4, 6.1, 6.2, 6.3, 7.1

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

- 1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.
- 1.2 Compare relationships among cells, tissue, organs, and systems.
- 1.4 Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.
- 6.1 Use personal protective equipment as appropriate to the environment.
- 6.2 Modify the environment to create safe working conditions. Evaluate and modify the environment to create and maintain safe working conditions.
- 6.3 Prevent accidents by using proper safety techniques for the prevention of accidents.
- 7.1 Identify content, skills and technology related to the health science field.

I can

- *I can identify and describe the major organs of the digestive system, including the mouth, esophagus, stomach, small intestine, large intestine, liver, gallbladder, and pancreas.
- *I can explain the process of digestion, including the mechanical and chemical breakdown of food, absorption of nutrients, and elimination of waste.
- *I can describe the functions of the different organs in the digestive system, such as the role of the stomach in acid secretion and digestion, the small intestine in nutrient absorption, and the liver in bile production and metabolism.
- *I can identify and describe the types of enzymes involved in digestion, such as amylase, protease, and lipase, and understand their specific roles in breaking down carbohydrates, proteins, and fats.
- *I can explain the process of nutrient absorption in the small intestine, including the mechanisms of diffusion, active transport, and osmosis, and understand how nutrients are transported to the bloodstream.
- *I can describe common digestive disorders and conditions, such as gastroesophageal reflux disease (GERD), irritable bowel syndrome (IBS), and celiac disease, and understand their causes, symptoms, and potential treatment options.

Vocab

Content: Digestion Gastrointestinal tract Oral cavity Esophagus Stomach Small intestine Large intestine Liver Gallbladder Pancreas Enzymes Absorption Peristalsis Chyme Bile

Academic: *Analyze *Classify *Design *Explain *Implement *Measure *Understand *Use a model



Anatomy & Physiology

Urinary System

Competencies

1.1, 1.2, 1.4, 6.1, 7.1, 7.6

Resources

Human Anatomy & Physiology, An Introduction to the Human Body

Standards

1.1 Describe the basic structures and functions of cells, tissues, organs, and systems as they relate to homeostasis.

1.2 Compare relationships among cells, tissue, organs, and systems.

1.4 Analyze the interdependence of the body systems as they relate to wellness, disease, disorders, therapies, and care rehabilitation.

6.1 Use personal protective equipment as appropriate to the environment.

7.1 Identify content, skills and technology related to the health science field.

7.6 Recognize, organize, write and compile technical information and summaries that relate to health science.

I can

*I can identify and describe the major organs of the urinary system, including the kidneys, ureters, bladder, and urethra.

*I can explain the functions of the urinary system, including the production, filtration, and excretion of urine, regulation of water and electrolyte balance, and elimination of metabolic waste products.

*I can describe the structure and function of the kidneys, including their role in blood filtration, reabsorption of water and essential substances, and secretion of waste products.

*I can explain the process of urine formation, including glomerular filtration, tubular reabsorption, and tubular secretion, and understand the factors that influence these processes.

*I can identify and describe the different parts of the nephron, the functional unit of the kidney, and understand their roles in urine formation and regulation.

*I can describe common disorders and conditions of the urinary system, such as urinary tract infections, kidney stones, and renal failure, and understand their causes, symptoms, and potential treatment options.

Vocab

Content: Kidneys Nephron Renal pelvis Ureters Bladder Urethra Filtration Reabsorption Secretion Urine Renal artery Renal vein Micturition Renin-angiotensin-aldosterone system Osmoregulation

Academic: *Apply *Analyze *Classify *Describe *Interpret *Represent *Use a model *Observe *Understand