Florida CTE

Human Body Systems

Investigate the anatomical and physiological commonalities in the human body. The student will be able to: 18.0	**01** List the major organs within each human body system and the functions of the different human body systems. 18.01
	02 Describe how multiple body systems are interconnected. 18.02
	03 Describe how the interconnections and interactions of multiple body systems are necessary for maintaining homeostasis. 18.03
	04 Demonstrate the correct usage of directional terms and regional terms to identify locations of the human body. 18.04
	05 Identify key directional terms on a model of the human body. 18.05
	06 Apply knowledge of human body systems to indicate how disease can impact function in another system. 18.06
Analyze the individual differences in body systems in tissues and cells. The student will be able to: 19.0	**01** Describe the differences in the appearance of epithelial and connective tissues. 19.01
	02 Explain the basic structure and function of the skeletal system. 19.02
	03 Identify the muscles in the face around the eyes and mouth. 19.03
	04 Interpret bone markings, bone landmarks and bone measurements to provide information about gender, race, ethnicity and height. 19.04
	05 Use mathematical calculations to predict height from the length of a bone. 19.05
Investigate the significance of DNA in relation to individual identity. The student will be able to: 20.0	**01** Explain how restriction enzymes cut DNA. 20.01
	02 Explain how gel electrophoresis separates DNA fragments by size. 20.02
	03 Analyze gel electrophoresis results. 20.03
	04 Define biometrics and through research create an argument related to ethical issues associated with it. 20.04
	05 Describe the way in which characteristics such as fingerprints, facial features and retinal patterns can be used to establish identity. 20.05

	06 **Design a comprehensive security plan for a real-world situation using biometrics.** 20.06
	07 **Understand the roles and responsibilities of a forensic anthropologist and a DNA analyst.** 20.07
Investigate the role the brain plays in the communication system of the human body. The student will be able to: 21.0	01 **Describe the general structure and function of the central nervous system.** 21.01
	02 **Interpret how a malfunction in the nervous system would impact the function of the human body.** 21.02
	03 **Identify the regions of the brain responsible for specific actions, emotions, or functions of human body.** 21.03
	04 **Differentiate the regions of the brain that are responsible for basic life functions.** 21.04
Determine how electrical communication works in the body. The student will be able to: 22.0	01 **Explain the basics of how electrical signals are created and transmitted in the human body.** 22.01
	02 **Explain the roles of ions in creating electrical impulses in the human body.** 22.02
	03 **Explain how neurotransmitters help propagate electrical impulses.** 22.03
	04 **Describe neuron structure and function.** 22.04 a Explain the ascending and descending pathways of the CNS. 22.04.A
	05 **Analyze how reflexes impact reaction time.** 22.05
	06 **Demonstrate an understanding of how nervous system disorder impacts quality of life.** 22.06
	07 **Research the roles and responsibilities of biomedical professionals who can improve the quality of life for those coping with nervous system dysfunction.** 22.07
	08 **Using data acquisition software to investigate the relationship between reflexes and reaction time.** 22.08
Determine how chemical communication works in the body. The student will be able to: 23.0	01 **Explain the basics of how hormones interact with target cells.** 23.01
	02 **Explain the difference between endocrine and exocrine glands as well as protein/peptide and steroid hormones.** 23.02
	03 **Using research, interpret the symptoms and physical characteristics of a patient to determine an endocrine system pathology.** 23.03
	04 **Explain in general how hormones contribute to maintain homeostasis.** 23.04

Investigate how the human body responds to external stimuli. The student will be able to: 24.0	**01** Describe the structures and function of the eye. 24.01
	02 Describe how the eye and the brain work together to produce vision. 24.02
	03 Explain and demonstrate visual perception, including visual acuity, depth perception, peripheral vision, color vision, and the interpretation of optical illusions. 24.03
	04 Utilize a Snellen chart to determine an individual's vision acuity. 24.04
	05 Explain how the lens of the eye utilizes light waves to produce a visual image and explain how to correct visual problems with corrective lenses. 24.05
	06 Describe the roles and responsibilities of an optometrist, ophthalmologist, and optician. 24.06
Describe the role food plays in the conversion and use of energy in the body. The student will be able to: 25.0	**01** Describe the human body systems that absorb process and distribute oxygen, water, and food. 25.01
	02 Describe the structure and function of organs in the human digestive system. 25.02
	03 Explain how energy is stored and released in ATP through the process of hydrolysis and phosphorylation. 25.03
	04 Assess overall health through analysis of calories consumed and calories expended in daily activities. 25.04
	05 Explain the structure and function of, enzymes and co enzymes and how they all work together. 25.05
	06 Explain the role of enzymes in maintaining homeostasis in the body. 25.06
	07 Demonstrate an understanding of both lock and key models and induced fit models of enzyme function. 25.07
	08 Interpret enzyme function in the digestive system through laboratory experiments. 25.08
	09 Build a model of the human digestive system 25.09
	10 Design and perform an experiment to determine optimal conditions for digestive enzyme reactions. 25.10
Describe the role of oxygen in cellular respiration and macromolecule metabolism. The	**01** Describe the structure and function of the human respiratory system. 26.01
	02 Explain the process of gas exchange in the lungs and identify where in the lungs gas exchange occurs. 26.02

student will be able to: 26.0	**03** Explain that the blood is the primary transport for oxygen and carbon dioxide in the body. 26.03
	04 Perform a spirometry test to determine an individual's tidal volume, inspiratory reserve volume, expiratory reserve volume, vital capacity, and total lung volume. 26.04
	05 Analyze the differences of various medications used to treat respiratory dysfunction and describe the various pharmacological routes of administration for each. 26.05
	05 Utilize pharmacological abbreviations to analyze prescriptions. 26.05.A
	06 Explain the roles and responsibilities of a respiratory therapist. 26.06
Describe the role of water in maintaining homeostasis. The student will be able to: 27.0	**01** Describe the structure and function of the human urinary system. 27.01
	02 Describe the structure and function of the kidney. 27.02
	03 Describe and illustrate the movement of fluids and ions in and out of the various parts of the nephron. 27.03
	04 Explain the role of ADH (anti-diuretic hormone) and Aldosterone on fluid and electrolyte balance in the body. 27.04
	05 Compare and contrast the composition of blood and urine. 27.05
	06 Build a model of the urinary system. 27.06
	07 Analyze the results of a urinalysis test and apply the results to determine dysfunction of the urinary system. 27.07
	08 Identify the components of a urinalysis test and determine when a urinalysis should be utilized. 27.08
Demonstrate an understanding of how joints directly contribute to the movement of the human body. The student will be able to: 28.0	**01** Describe the structure and function of a hinge joint, ball and socket joint, pivot joint, saddle joint, and gliding joint and be able to identify an example of each. 28.01
	02 Describe the normal motion of various joints in the body using correct terminology. 28.02
	03 Measure joint range of motion of various joints using a goniometer or determine the normal range of motion for various joints in the body. 28.03
	04 Compare the structure of a cow elbow to a human elbow. 28.04
	05 Discuss differences in an individual's range of motion and the reason for these differences. 28.05

	06 Discuss ways to improve joint flexibility such as stretching and other lifestyle modifications. 28.06
Demonstrate an understanding of how muscles directly contribute to the movement of the human body. The student will be able to: 29.0	01 Describe the structure and function of the three types of muscle tissue. 29.01
	02 Identify specific muscles of the body and understand how muscles are named. 29.02
	03 Describe the steps of muscle contraction. 29.03
	04 Explain the sliding filament mechanism of muscle contraction. 29.04
	05 Explain the connection between nerves and muscle. 29.05
	06 Interpret muscle function by examining structure and attachment to bone. 29.06
	07 Build a model of a muscle group. 29.07
	08 Explain why rigor mortis occurs using the concepts of muscle contraction. 29.08
	09 Determine the role of calcium in muscle contraction. 29.09
Demonstrate an understanding of how blood flow acts as a transport for substances through the human body. The student will be able to: 30.0	01 Explain the relationship between the heart and lungs and the path of blood flow through these organs. 30.01
	02 Demonstrate how to take a pulse and explain the steps of how to take blood pressure. 30.02
	03 Identify major arteries and veins and specify the body region each supplies. 30.03
	04 Interpret ankle brachial index (ABI) to determine possible blood vessel blockages. 30.04
	05 Understand the relationship between the amounts of blood pumped by the heart through analysis of cardiac output values. 30.05
	06 Investigate peripheral artery disease related to patient health through the analysis of patient symptoms and diagnostic testing. 30.06
	07 Explain the structure and function of veins and explain how varicose veins form. 30.07
	08 Build a model of the major circulatory routes. 30.08
	09 Analyze risks for cardiovascular disease. 30.09
Using knowledge of power and movement in	01 Explain the human body's ability to generate ATP for the specific time period needed to fuel itself. 31.01

the human body, describe how the body fuels and responds to exercise. The student will be able to: 31.0	**02** Assess muscle fatigue through interpretation of EMG and grip strength. 31.02
	03 Design an experiment to test and analyze muscle fatigue. 31.03
	04 Describe how the major body systems respond to exercise. 31.04
	05 Understand how a training plan is designed for a fictional client, incorporating the specific health situation of the client. 31.05
	06 Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration. 31.06
Describe the structure and function of the integumentary system. The student will be able to: 32.0	**01** Classify the various degrees of burns and determine which layers of skin have been damaged for each. 32.01
	02 Explain how burns impact the normal function of the skin and how the damage disrupts homeostasis in the body. 32.02
	03 Explain how the body senses and responds to pain. 32.03
	04 Explain why pain is necessary to human survival. 32.04
	05 Determine the structures that have been damaged following a burn to the skin. 32.05
	06 Analyze the rehabilitation a burn victim must undergo and the impacts it will have on activities of daily living. 32.06
Describe the composition of bones and how the skeletal system serves as a protection for the human body. The student will be able to: 33.0	**01** Describe and compare the structure and function of compact and spongy bone. 33.01
	02 Describe the different types of bone fractures. 33.02
	03 Identify bone fractures on x-rays and describe possible damage to internal organs. 33.03
	04 Describe the roles of calcitonin and parathyroid hormone in the human body 33.04
	05 Describe the stages of bone remodeling. 33.05
	06 Identify lifestyle choices that affect development and maintenance of healthy bones. 33.06
Describe the composition the immune system and how it serves as a protection for the	**01** Describe the structure and function of the lymphatic and immune system. 34.01
	02 Describe the roles of antigens and antibodies. 34.02
	03 Explain the role of blood cells in specific immunity. 34.03

human body. The student will be able to: 34.0	**04** Understand how a pedigree can assist in determining blood types in a family. 34.04
	05 Interpret data on antibody concentrations after an infection. 34.05
	06 Determine potential blood donors for a transfusion through the analysis of blood types and Rh compatibility. 34.06
Analyze how various external factors require body systems to work together to maintain health and homeostasis. The student will be able to: 35.0	**01** Describe how various body systems respond to extreme external changes in the external environment. 35.01
	02 Explain how body systems work together to maintain homeostasis and complete basic functions. 35.02
	03 Understand how initial symptoms of an illness can lead to diagnosis and treatment. 35.03
	04 Evaluate objective data to create a patient case study. 35.04
	05 Understand that different diseases require different medical interventions. 35.05
	06 Research the role of various medical professionals who will diagnose and treat a fictional patient. 35.06