

Pequannock Township School District Curriculum Syllabus

Course Name and level / Grade level and Subject: Anatomy and Physiology/Grade Level 11-12

Course Description:

Anatomy and physiology is a science elective focusing on a detailed study of the human body systems including homeostatic balance, the relationship between structure and function and the interrelationships between body systems. This course is recommended for students interested in a health-related career such as medicine, nursing, physical therapy, athletic training and other science majors. Laboratory activities will explore microscopic analyses of tissue specimens and other dissections.

Course Standards:

The following is a list of NJSLS that describe what students are expected to know and be able to do as a result of successfully completing this course. The following NJSLS are the basis of the assessment of student achievement. The learner will demonstrate mastery of:

1. **HS-LS1-2** [Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.]

Scope and Sequence

Unit 1(5 Days) This unit explores the basic functions of living organisms and the mechanisms that maintain homeostasis. Students will learn the anatomical terms to describe body sections, body regions and relative positions. Basic themes run throughout the course of this class. This unit serves to introduce the students to the basic functions of living organisms, reviews the concept of homeostasis and introduces positive and negative feedback systems in response to homeostatic regulation. Also included in this unit are the anatomical terms to describe body sections, body regions, and relative positions. These terms will be extremely important to the study of anatomy and physiology

Unit 2 (5 Days)The body is composed of chemicals and all body activities are chemical in nature. It is vital to become familiar and

understand the language and the basic ideas of chemistry to understand and appreciate human anatomy and physiology. Students will explore the chemistry within the biological systems to deepen understanding of living things.

Unit 3 (5 Days)Cells are the building blocks of all plants and animals that perform all vital physiological functions. An organism maintains homeostasis through the coordination of all its cells, working individually and together. To study and understand the chemical level of organization, scientists consider the simplest building of cells and their specific function.

Unit 4 (10 Days) Humans are multicellular organisms; therefore, no single cell can single handedly run the body. Through differentiation, each cell becomes specialized to handle a small range of functions. Cells that have the same basic functions combine to form tissues. This unit addresses the different types of tissues and their structure and functions. It is impossible to appreciate the normal functioning of many organs -- such as lung or kidney or liver or brain -- without some detailed knowledge of how their cells are organized into tissues. In such cases, specific facts from histology provide essential strands in a web of understanding. Some important clinical processes, notably inflammation and neoplasm, are essentially tissue-level phenomena.

Unit 5 (10 Days)The skin and its derivatives (sweat and oil glands, hair and nails) make up a complex set of organs that serves several functions, mainly protective, but the integumentary system also plays a large role in homeostasis and sensory reception. This unit will address the main components of this system and how they function to fulfill the five major roles they play. Of all the body's organs, none is more easily inspected or more exposed to infection, disease, and injury than the skin.

Unit 6 (20 Days)The human body would not have a shapeless without the skeletal system. It would it be able to support its own

weight. Bones also work with the muscles to maintain position and produce movement. The unit begins with a look at the different types of bone tissue, an overview of how bone grows and repairs itself, and then focuses on the bones of the axial and appendicular skeleton. Despite their simple appearance, bones are complex and dynamic living tissues that are remodeled continuously. Because the skeletal system forms the framework of the body, a familiarity with the names, shapes, and positions of individual bones will help a student to locate and name many other anatomical features.

Unit 7 (20 Days) Movement, blood flow, breathing, and digestion cannot occur without muscle tissue. The unit begins with skeletal

muscle tissue, and then an account of smooth and cardiac muscle tissue. There is a focus on the physiology of the muscle tissues as well. Develop a knowledge of key aspects of skeletal muscle anatomy to understand how normal movements occur.

Unit 8 (15 Days) The nervous system is the system that maintains total control over the entire body and serves as the hub of its

communication. Every action, emotion, and thought is reflected in the activity of this system. Students must understand the function of the nervous and endocrine systems to explore the disorders and diseases of each system.

Unit 9 (20 Days) Although the heart is easily the most recognizable organ and essential to life, it cannot work alone. In an effort to

maintain homeostasis, the organs of the cardiovascular system work together to keep the blood continually circulating and deliver a constant supply of oxygen to the body. The students must study the heart and its function as well as the instrumentation used to detect function, ailments and diseases.

Unit 10 (10 Days) The lymphatic system is essential for the proper functioning of the entire body. It plays an essential role as a defender of the body from pathogens and in building resistance to disease. The lymphatic system transports lymph containing white blood cells throughout the body to assist in purging the body of waste materials and the removal of foreign pathogens including bacteria.

Unit 11(15 Days) The respiratory system shoulders some of the responsibility along with the cardiovascular system for supplying the

body with oxygen and disposing of carbon dioxide. The organs of the respiratory system are specifically involved in the gas exchanges that occur between the blood and cells and the blood and the external environment. A healthy respiratory system is crucial to an individual's overall health, and respiratory distress is often one of the first indicators of a life-threatening illness. The function of the respiratory system is to exchange gases between the external air and the body. The lungs are the primary organ of the respiratory system that performs this function.

Unit 12(15 Days) This unit concentrates on the functioning of the digestive and excretory systems. While the digestive system is vital for breaking down food into nutrient molecules and absorbing them into the bloodstream, the excretory system is equally important in the removal of wastes from the body. Digestion is an important process that involves breaking

down food and drink into small molecules that can be transported and used by the cells of the body. The digestive system consists of a one-way track, called the gastrointestinal (GI) tract, that food travels through. At various points of the GI tract, digestion, absorption, and elimination occur. Each section has been structured to perform a specific function.

Unit 13(10 Days)The urinary system is essential for maintaining homeostasis by regulating water balance, electrolytes, and the pH of the blood, while also removing nitrogenous wastes from the body.The urinary system consists of a number of organs and structures designed to assist in maintaining homeostasis within the body through the removal of waste and the regulation of water balance, electrolytes, and the pH level of blood

Unit 14(15 Days) The reproductive system ensures the continuity of the species by producing offspring.The male and female reproductive systems are regulated by a series of complex hormonal processes designed to produce offspring through ovulation, fertilization, and gestation.

Assessments

Evaluation of student achievement in this course will be based on the following:

- a. *Quizzes, Unit tests, lab activities, research projects, diagrams, case studies, articles, video guides*

Curriculum Resources

Anchor Programs/Teacher Materials

Anatomy and Physiology: From Science to Life

Home and School Connection

The following are suggestions and/or resources that will help parents support their children:

- *Discovery Education*
- *Kahn Academy*
- *Wiley Animations*
- *McGraw Hill Animations*