

# Anatomy and Physiology Syllabus

Anatomy and Physiology of Human Systems includes laboratory investigation and fieldwork using appropriate inquiry. This hands-on course is a survey of the structures and functions of the human body and homeostasis within body systems. In this course the student will investigate the body's maintenance of homeostasis, body coordination, control systems, transport systems, energy processes, and continuation of the species.



## Organization (25 days)

Students will be introduced to the vocabulary of Anatomy and review basic cellular structure. They will use microscopes to explore histology so they can better understand the systems to come. Students will build a model of the skin to understand the structures and relate to function, as well as study skin samples under the microscope, to see physical differences. Throughout the year students will study advances in stem cell research, bioengineering, and transplant technology.



## Control and Coordination (32 days)

Students will study bones in the skeleton to recognize that structure relates to function. They will differentiate between types of joints and their movements to understand the differences. They will study the neuromuscular junction, and the sarcomere, and how muscles contract. Students will study the functions of the central and peripheral nervous systems and how they connect. They will test their own reflexes, and develop an understanding of the indication for health. A cow eye will be dissected to inspect the parts of a mammalian eye. Taste and smell will be tested to better understand how sensory receptors function.



## Transport (41 days)

Students will build a model of the respiratory system, demonstrating the difference between healthy and diseased lung tissue. Students will then dissect a heart to explore the structures of the heart and associated vessels. They will study the cell structure and functions of red and white blood cells, and discuss the transport of materials around the body and connect the exchanging of gasses with the respiratory system. Students will differentiate between the lymphatic and immune systems, as well as understand the connections between them and the cardiovascular system. There will be exploration into immune system dysfunctions, including allergies, immunodeficiencies and autoimmune disorders.



## Excretion (19 days)

Students will dissect a kidney in this unit, and discuss the contents of blood filtrate and how it relates to health. They will study the relationship between the urinary and digestive systems to understand waste disposal in the body. Students will also model the digestive system, including the connection to the circulatory system, to understand how substances are transported around the body.



## Continuing the Species (27 days)

This unit is a focused study of hormones, reproduction and development of the human being. Students will learn which glands produce various hormones, and investigate how hormonal imbalances can cause different diseases. Activities will help students explain the embryological development of cells, tissues, organs and systems. Students will identify the functions of the male and female reproductive systems. They will be able to summarize the human growth and development cycles.