Curriculum Units and Learning Outcomes

Content Area: Anatomy and Physiology	**Grade Level: 11-12**
Unit Title: Biochemistry and the Human Body	
Unit Summary: Students will be exploring the chemicals essential for life including water, carbohydrates, proteins, lipids, nucleic acids and electrolytes. Students will research a variety of diseases that result from a small change in the amount or functioning of each chemical which may cause a large change in the homeostatic balance of the human body resulting in disease or death. In the lab, students will investigate the enzyme amylase found in saliva and how it is affected by temperature and pH. Students will also examine the use of lactaid to help people with lactose intolerance.	
Massachusetts Standards: ● No Massachusetts Standards exist for this curriculum	
Enduring Understandings: Students will understand that: ● The chemical levels in the human body underlie all structure and physiological processes that take place.	
Essential Questions: ● How do chemicals contribute to body structure, function and homeostasis?	

Students will demonstrate KNOWLEDGE of:	**Students will be SKILLED at**:
● the four elements make up most of the human body ● the symbols for oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, potassium,	● Organizing and interpreting evidence from the digestion of starch by amylase. ● Reading current science articles about sugar in the human diet and explaining supporting evidence of conclusions drawn from the studies.

sulfur, sodium, chlorine, magnesium, iodine and iron. ● the difference between organic and inorganic molecules. ● the pH scale and the differences between an acid and a base and how they are used in important applications in the human body ● the 4 major groups of organic molecules including the building blocks and their importance to the human body. ● the structure and the importance of ATP. ● the importance of the proteome and the classification of proteins used by the human body ● the relationship of structure and function using the primary and tertiary structures of proteins using enzymes ● the importance of the sequence of DNA to the proper functioning of proteins in the human body. ● the properties of water that make it so important to the human body. ● how small amounts of minerals and vitamins are important to vital chemical functions of the human body. ● how food is broken down by the digestive system into building blocks and absorbed by the body and transported to parts of the human body to store, use in chemical production or energy production.	● Using a model to explain the role of glucose in the human body. ● Comparing proteins produced and used in the human body that are part of the proteome. ● Comparing the functions of vitamins used in the human body. ● Distinguishing the effects of diseases on structure and function - diabetes type II, sickle cell, cystic fibrosis osteoporosis, lactose intolerance and PKU. ● Analyzing blood chemistry reports to recognize chemical imbalances in the body

● the biochemical causes of human diseases and how they affect the human body ● the use of lactaid to help lactose intolerant individuals	

Estimated Duration: 4 weeks