

Course Name: Anatomy & Physiology

Course #: H3502 Grades: 11-12 Level: Academic Year: 5X Credits: 5

Prerequisite: Biology I and Chemistry I

Course Description:

Building on the knowledge acquired in Physics I and Chemistry I, Anatomy & Physiology provides a strong foundation in biological concepts with a focus/emphasis on the structural and functional relationships in the human body. Teachers use multiple techniques in exploring A&P topics; including cell biology, biochemistry, genetics, anatomy, physiology, public health, general medicine and sports medicine. The major organ systems studied will include the skeletal, muscular, respiratory, cardiovascular, endocrine, digestive, excretory, integumentary, lymphatic, and reproductive systems. Students will continue their development of an analytical approach to human biology using both concrete and abstract thinking skills. Students will use a variety of research skills including traditional laboratory and library sources, as well as emerging technology.

Course Proficiencies:

The following is a list of skills and concepts that students will be proficient in upon successful completion of this course. These proficiencies form the basis of assessment of each student's achievement. Students will be able to:

1. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms by:
 - a. Comparing and contrasting the order of increasing complexity of the levels of organization of the body. *(HS-LS1-2)*
 - b. Understanding the anatomy and physiology of the major organ systems. *(HS-LS1-2)*
 - c. Delineating how the cell operates as the basic unit of the human body with regard to growth and energy requirements. *(HS-LS1-2)*
2. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis by analyzing the complex role of organ systems, evaluating the activity of organs they perform interdependent functions. *(HS-LS1-3)*
3. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules by analyzing the complex role of organ systems, evaluating the activity of organs as they perform interdependent functions. *(HS-LS1-6)*
4. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. *(HS-LS1-7)*
5. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins that carry out the essential functions of life through systems of specialized cells. *(HS-LS1-1)*

6. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. **(HS-LS3-1)**
7. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. **(HS-LS3-2)**
8. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering by applying their knowledge of the human body to current issues related to disease and sports medicine. **(HS-ETS1-2)**
9. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem by:
 - a. Applying and evaluating scientific methods throughout the course. **(HS-ETS1-4)**
 - b. Demonstrating knowledge of and ability to safely use laboratory equipment and materials. **(HS-ETS1-4)**
 - c. Using microscopy to identify various types of tissue from major organ systems. **(HS-ETS1-4)**
 - d. Demonstrating the ability to dissect mammalian specimens and observe their anatomy. **(HS-ETS1-4)**
 - e. Effectively use technological tools/applications to assist in the collecting, analyzing/interpreting, and conveying of data and information. **(HS-ETS1-4)**
10. Select and use technology applications effectively and productively to gather, evaluate and use the information to explore a problem, develop a solution, and communicate ideas. **(8.1.12.A.4, 8.1.12.A.5, 8.1.12.E.1, 8.1.12.F.1)**
11. Develop an understanding of the nature and impact of technology, engineering, design, and computational thinking on the individual, global society, and the environment. **(8.2.12.C.7, 8.2.12.D.1)**
12. Review career goals and determine steps and skills needed for attainment. **(9.2.12.C.1, 9.2.12.C.2, 9.2.12.C.3)**

Assessment:

A variety of evaluation tools will be used to determine student achievement in this course. Any or all of the following tools will be used:

- Tests and quizzes.
- Laboratory performance, reports, and journals.
- Class participation.
- Well-developed homework.
- Technology-based activities.
- Projects, including oral presentations.
- Self or peer assessment.
- Teacher observation.

Board Approved Textbook:

Title: Anatomy & Physiology: From Science to Life

Authors: Jenkins, Kemnitz & Tortora

Publisher: John Wiley & Sons, Inc.

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