

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Principles of Biomedicine

Board Approval Date: October 21, 2021	Course Length: 2 Semesters
Grading: A-F	Credits: 5 Credits per Semester
Proposed Grade Level(s): 9, 10, 11, 12	Subject Area: Life Science Elective Area (if applicable): N/A
Prerequisite(s): Biology of the Living Earth & Integrated Math 1	Corequisite(s): N/A
CTE Sector/Pathway: N/A	
Intent to Pursue ‘A-G’ College Prep Status: Yes	
A-G Course Identifier: (d) Laboratory Science	
Graduation Requirement: No	
Course Intent: Site Specific Program (if applicable):	
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COURSE DESCRIPTION:

The Principles of Biomedicine course provides an introduction to biomedical science through hands-on projects and problems. Students investigate concepts of biology and medicine as they explore health conditions including heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases. The activities and projects in this course introduce students to human physiology, basic biology, medicine, and research processes. Key biological concepts, including maintenance of homeostasis in the body, metabolism, inheritance of traits, and defense against disease are embedded in the curriculum.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Introduction to Biomedical Science and Experimental Design	What is biomedical science and who is involved? What are the necessary safety precautions in a lab? How do scientists set up a controlled experiment? What types of organisms and cells are studied in medical and biotechnology facilities?	*Handouts *Quizzes/Mastery Checks *Career TED Talks - Student Presentations	*Unit Exam/Project
2. Macromolecules, Metabolism, and Disease	How do scientists use indicator solutions and standards to test for the presence of biologically important molecules, such as carbohydrates, lipids, proteins, and nucleic acids? How do feedback mechanisms maintain homeostasis in the human body?	*Handouts *Quizzes/Mastery Checks *Labs -Macromolecule testing using indicators, calorimetry lab *Molecular Puzzles-Macromolecules *Career TED Talks - Student Presentations	*Unit Project/Exam
3. Genetic Testing and Screening	What is DNA and how has its discovery impacted society and science? How does DNA serve as the basis for all life processes? What are examples of basic techniques used to manipulate genetic material to diagnose genetic disorders?	*Handouts *3-D DNA models *Sample Gel Electrophoresis Paper model *Labs- DNA isolation lab from fruit or saliva, cholesterol diagnostics lab (I believe we have a few kits left over from the PLTW days) *Quizzes/Mastery Checks *Career TED Talks - Student Presentations	*Unit Project/Exam
4. Anatomy & Physiology (Cardiovascular Focus)	*What is the structure and function of the cardiovascular system? *How does disease of the cardiovascular system	*Handouts *Labs-measuring vital signs, virtual dissection *Quizzes/Mastery Checks *Career TED Talks - Student	*Unit Project/Exam

	affect other body systems?	Presentations	
5. Infectious Disease	How does the immune system respond when an antigen enters the body? How do scientists characterize and identify bacteria by their shape, colony morphology, metabolism, and reaction to the Gram stain.	*Handouts *Quizzes/Mastery Checks *Career TED Talks - Student Presentations	*Unit Project/Exam

ESSENTIAL STANDARDS:

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

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HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://www.cde.ca.gov/pd/ca/sc/documents/cangsshs-dcilifesci.pdf>

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
		<i>N/A</i>				

Other Resource Materials

The Living Earth (textbook), HMH, 7th edition, 2020, 2020

Supplemental Materials

Board approved supplemental materials (Including but not limited to: Film Clips, Digital Resources, Supplemental texts, DVDs, Programs (Pebble Creek, DBQ, etc.):

N/A