

Principles of Biomedical Science

RCAS Policies/Procedures:

Students will be required to follow all RCAS policies and procedures. To view the RCAS High School Student Handbook, click [handbook](#).

Course Description:

Principles of Biomedical Science (PBS) is a full-year high school course in the PLTW Biomedical Science Program. This course serves to provide foundational knowledge and skills in fields such as biology, anatomy & physiology, genetics, microbiology, and epidemiology as well as engage students in how this content can be applied to real-world situations, cases, and problems. Through both individual and collaborative team activities, projects, and problems, students will tackle real-world challenges faced by biomedical professionals in the field. They will work with the same tools and equipment used in hospitals and labs as they engage in relevant hands-on work. Students will develop skills in technical documentation to represent and communicate experimental findings and solutions to problems. In addition, students will explore how connections to other disciplines such as computer science and engineering shape the future of medicine and practice collaboration techniques that will help them connect with professionals across any field.

Textbook:

Instead of a textbook, students will access the online curriculum through the Project Lead the Way website.

Required Resources:

“Limited Choice” Resources: (students will be asked to choose at least one title from this list)

Student Choice:

Will student be asked to choose additional reading material from the classroom or school library?

No

Essential Questions:

Unit 1:

What are different forms of evidence, how infallible are they, and how are they useful in resolving potential criminal cases?

How can varying forms of evidence be evaluated for meaning?

How does technology help bring resolution to forensic cases, or how does technology advance the understandings in forensic science?

How can the cause, mechanism, and manner of death be established?

What information can be collected from an autopsy?

How can information collected during an autopsy lead to an understanding of disease and/or cause of death?

In what ways are the careful evaluation of evidence and accurate recording of data critical to establishing legitimate testimony?

How can individual pieces of evidence, evaluated against the whole, be used to resolve questions?

In what ways can scientific writings and presentations be utilized to present evidence and justify conclusions?

To what extent can current understandings be reinforced through practice?

Unit 2:

How can an individual's health status be assessed and evaluated?

What factors make an individual more susceptible to disease?

What are strategies for maintaining health?

What are effective means of communicating with others in order to reach common goals?

What qualities make for an effective medical professional?

In what ways, and for what purpose, can patient confidentiality be maintained?

How can changes in a genome lead to disease?

Why is an understanding of heredity an important factor in human health?

In what ways are genetic changes acquired?

In what ways can altered biological processes lead to disease?

How can the genetic health of an individual be evaluated?

Unit 3:

In what ways, and for what purpose, can microorganisms be characterized?

What factors affect the growth and death of microorganisms?

What are effective strategies for preventing and treating disease?

How does an immune system identify and eradicate infection?

How can pieces of evidence be evaluated to form conclusions and inform decisions?

How can an individual's health status be assessed and evaluated?

How is patient case information summarized and communicated efficiently?

What professions respond in emergency situations, what are their roles, and how do they work together?

What are several career paths in the field of emergency medicine?

How do patient vitals and presumptive diagnoses inform the prioritization for treatment options in emergency medical situations?

What makes for effective emergency and disaster response protocols?

How do medical professionals manage emergencies that involve multiple patients?

To respond to emergency situations, what common medical resources and facilities need to be available?

What are features of a user-friendly app?

In what ways can technology enable a faster response and quicker resolution during medical emergencies?

Unit 4:

How do the engineering and experimental design processes enable innovation?

Who innovates, and why?

What is the process for innovation and what personal characteristics are required for success?

How do innovations impact and advance human health?

How does technology function as a vehicle for innovation?

In what ways do different types of scientists and engineers collaborate in the biomedical sciences field?

What are potential untapped resources that could work to advance the field of biomedical sciences?

Essential Learning Intentions:

Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining

information, while communicating effectively.

Foundation Standard 3: Systems: Identify how key systems affect services performed and quality of care.

Foundation Standard 4: Employability Skills: Use employability skills to enhance employment opportunities and job satisfaction.

Foundation Standard 5: Legal Responsibilities: Describe legal responsibilities, limitations, and implications on healthcare worker actions.

Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, coworkers, and self. Employ safe work practices and follow health and safety policies and

procedures to prevent injury and illness.

Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Foundation Standard 10: Technical Skills: Apply and demonstrate technical skills and knowledge common to health career specialties.

Foundation Standard 11: Information Technology in Healthcare: Apply information technology practices common across health professions.