



Park Hill School District

Building Successful Futures • Each Student • Every Day

High School PLTW Principles of Biomedical Science

Course Description: Students investigate various health conditions including heart disease, diabetes, sickle-cell disease, hypercholesterolemia, and infectious diseases. They determine the factors that led to the death of a fictional person and investigate lifestyle choices and medical treatments that might have prolonged the person's life. The activities and projects introduce students to human physiology, medicine, and research processes. This course provides an overview of all the courses in the Biomedical Sciences program and lays the scientific foundation for subsequent courses. © 2020 Project Lead The Way. *This course is copyrighted by Project Lead The Way, Inc. All rights are reserved to Project Lead The Way. This course outline can be found at www.PLTW.org.*

Scope and Sequence:

Time Frame	Unit	Instructional Topics
5 weeks	Medical Investigation	Topic 1: Medical Investigation
4 weeks	Critical Care	Topic 1: Critical Care
4 weeks	Outbreaks and Emergencies	Topic 1: Outbreaks and Emergencies
5 weeks	Innovation, Inc.	Topic 1: Innovation, Inc.

Curriculum Revision Tracking

Summer 2020

- Although many components of the previous curriculum are included, this was an overall complete revision of the course.

Essential Learning Outcomes:

- ELO 1: Students identify different forms of evidence to evaluate for meaning and to resolve potential criminal cases.
- ELO 2: Students utilize technology to bring resolution to forensic cases.
- ELO 3: Students apply the concepts of cause, mechanism, and manner to establish causes of death.
- ELO 4: Students analyze information collected during an autopsy leading to the understanding of disease and/or case of death.
- ELO 5: Students understand how the careful evaluation of evidence and accurate recording of data is critical to establishing a legitimate testimony.
- ELO 6: Students understand how to assess and evaluate an individual's health status.
- ELO 7: Students explain why heredity is an important factor in human health.
- ELO 8: Students analyze what qualities make an effective medical professional.
- ELO 9: Students identify in what ways, and for what purpose, microorganisms can be characterized.
- ELO 10: Students explain what professionals respond to emergency situations, what are their roles, and how they work together.
- ELO 11: Students analyze the ways that technology enables a faster response and quicker resolution during medical emergencies.
- ELO 12: Students identify how engineering and experimental design processes enable innovation.
- ELO 13: Students analyze how innovations impact human health.
- ELO 14: Students identify potential untapped resources that could advance the field of biomedical sciences.

Unit 1: Medical Investigation

Subject: PLTW Principles of Biomedical Science

Grade: 10-12

Name of Unit: Medical Investigation

Length of Unit: 4 weeks

Overview of Unit: Students engage in forensic science and medical examination investigations to explore biological and forensic science careers and gain experience in experimental design and data analysis. Through the investigation of a mysterious death, students learn about:

- Biomolecules and their role in determining identity
- Human anatomy and physiology & Interconnectedness of systems

Topic 1: Medical Investigation

Activity	Title	ELO
Activity 1.1.1	Investigating the Scene	Students identify different forms of evidence to evaluate for meaning and to resolve potential criminal cases. Students utilize technology to bring resolution to forensic cases.
Activity 1.1.2	Master the Morgue	Students apply concepts of cause, mechanism, and manner to establish causes of death. Students analyze information collected during an autopsy leading to the understanding of disease and/or case of death.
Activity 1.1.3	Open Investigation	Students understand how the careful evaluation of evidence and accurate recording of data is critical to establishing a legitimate testimony.

Board Approved: June 9, 2016

Page | 4

Board Approved with Revisions: August 13, 2020

© 2020 Project Lead The Way. *This course is copyrighted by Project Lead The Way, Inc. All rights are reserved to Project Lead The Way. This course outline can be found at www.PLTW.org.*

Unit 2: Critical Care

Subject: PLTW Principles of Biomedical Science

Grade: 10-12

Name of Unit: Critical Care

Length of Unit: 4 weeks

Overview of Unit: Students assume the role of different medical professionals working through the schedule of patients in a family care clinic. Over the course of the unit, students:

- Explore medical careers
- Practice professional communication
- Gain experience collecting, recording, and interpreting physiological data
- Learn how to perform routine medical tests and evaluate results

Topic 1: Critical Care

Activity	Title	ELO
Activity 2.1.1	Talk to you Doc	Students understand how to assess and evaluate an individual's health status.
Activity 2.1.2	Decoding Diagnosis	Students explain why heredity is an important factor in human health.
Activity 2.1.3	New to the Practice	Students analyze what qualities make an effective medical professional.

Unit 3: Outbreaks and Emergencies

Subject: PLTW Principles of Biomedical Science

Grade: 10-12

Name of Unit: Outbreaks and Emergencies

Length of Unit: 4 weeks

Overview of Unit: Working as public health officials and then as emergency responders, students are presented a series of events they must address while exploring careers in epidemiology, public health, microbiology, and emergency medicine. Students have the opportunities to develop their professional communication and presentation skills. Key skills highlighted include data analysis, medical decision making, patient diagnosis, identification of agents of disease, first aid, triage, and strategies involved in disaster preparedness and response.

Topic 1: Outbreaks and Emergencies

Activity	Title	ELO
Activity 3.1.1	Nosocomial Nightmare	Students identify in what ways, and for what purpose, microorganisms can be characterized.
Activity 3.1.2	Emergency Response	Students explain what professionals respond to emergency situations, what are their roles, and how they work together.
Activity 3.1.3	Information Sharing	Students analyze the ways that technology enables a faster response and quicker resolution during medical emergencies.

Board Approved: June 9, 2016

Page | 6

Board Approved with Revisions: August 13, 2020

© 2020 Project Lead The Way. *This course is copyrighted by Project Lead The Way, Inc. All rights are reserved to Project Lead The Way. This course outline can be found at www.PLTW.org.*

Unit 4: Innovation, Inc.

Subject: PLTW Principles of Biomedical Science

Grade: 10-12

Name of Unit: Innovation, Inc.

Length of Unit: 4 weeks

Overview of Unit: PLTW Innovation, Inc., is an incubator for innovation where some of the best minds in science and engineering endeavor to solve some of the world's most pressing biomedical challenges. Students tour PLTW Innovation, Inc. labs virtually and engage in experiences designed to build their engineering and experimental design process skills and to create solutions to current and emerging issues both on and off this earth. Students will build their computer science skills by using computer-aided design (CAD) and geographic information systems (GIS) and unite these skills with their science and engineering experiences to innovate the future of medicine. This unit demonstrates that solutions to biomedical science problems rely on collaboration between professions.

Topic 1: Innovation, Inc.

Activity	Title	ELO
Activity 4.1.1	Designing the Future	Students identify how engineering and experimental design processes enable innovation.
Activity 4.1.2	New Frontiers	Students analyze how innovations impact human health.
Activity 4.1.3	Pioneering the Future	Students identify potential untapped resources that could advance the field of biomedical sciences.

Board Approved: June 9, 2016

Page | 7

Board Approved with Revisions: August 13, 2020

© 2020 Project Lead The Way. *This course is copyrighted by Project Lead The Way, Inc. All rights are reserved to Project Lead The Way. This course outline can be found at www.PLTW.org.*