



PLTW Biomedical Science Covid-19 Pandemic | Course Outline

Take on the role of public health officials charged with identifying and implementing measures to bring the pandemic under control in their community. Explore strategies used to navigate and resolve pandemics, learn about the body's response to infectious disease, investigate the virology of the SARS-CoV-2 virus, and engage in discussions around the legal, social, and ethical issues inherent with global health crises.

The COVID-19 Pandemic module is a supplemental, flexible, and compact (18-day) module available to all high school classes in the PLTW Biomedical Science Pathway. The high-quality, timely, and relevant content challenges students to explore numerous facets of the historic global event of the 2019 Novel Coronavirus outbreak.

The module is a comprehensive learning progression comprising four activities, a project, and a problem (APBs). You can use the entire sequence as a standalone lesson, or use specific APBs from the module to supplement existing course material. The module content connects with PLTW Biomedical Science (BMS) courses as outlined in the Content Connections to BMS Courses table.

Content Connections to BMS Courses	
Principles of Biomedical Science (PBS)	Unit 3: Outbreaks and Emergencies
Human Body Systems (HBS)	Unit 3: Adventure Awaits
Medical Interventions (MI)	Unit 1: How to Fight Infection
Biomedical Innovation (BI)	Problem 5: Combating a Public Health Issue

The immersive COVID-19 Pandemic experience highlights how biomedical science, computer science, and engineering professionals work together to solve global problems. Key experiences include:

- Engaging in contact tracing
- Using predictive models to analyze measures to prevent the spread of disease
- Reimagining infrastructure and brainstorming behavioral shifts to ensure safe schools and businesses
- Designing a response plan in preparation for future outbreaks

Activity 1: Pandemic (3 days)

Students assume the role of public health officials tasked with pulling together a response plan to limit the spread of SARS-CoV-2 in their community. They are shadowed by a local reporter who is interested in the science of this pandemic as well as the social aspects. Students review historical pandemics and look for proven strategies to stop the spread of disease, investigate the structure of the virus and the infection it causes, and create an artifact that captures a snapshot of our world during this historic moment.



Activity 2: Cataloging Contacts (3 days)

Students investigate the art and science of contact tracing, trying their hand at it as they investigate the web of contacts linked to a single positive test. They learn about the iceberg concept of disease and the chain of infection, and interview individuals to identify connections as they try to break the chain to stop the spread of COVID-19.

Activity 3: Predict and Prevent (3 days)

Students learn about the strategies for limiting the spread of SARS-CoV-2. They investigate the benefits and limitations of each strategy and use predictive models to evaluate the effectiveness of each intervention.

Activity 4: Vaccinate to Eradicate (2 days)

Students explore the role of vaccines in preventing infections. They view a simulation to investigate how an increasing vaccination rate in a population affects the numbers of infected individuals over time. Using real data from the Centers for Disease Control and Prevention (CDC) COVID Data Tracker dashboard, students analyze vaccination rates and trends. They apply their learning to develop a plan for vaccine distribution during a growing viral outbreak.

Project: Redesign to Recover (3 days)

Students collaborate to analyze the structure of a given school building and propose changes to the layout and composition of specific areas, such as the cafeteria, science lab, and halls, to keep students and teachers safe. They think through how spacing, hygiene, and scheduling impact the spread of infectious agents and the overall safety of all who enter the building.

Problem: Future Focused (4 days)

Students develop a preparation and response plan for mitigating future pandemics to present to the community's city council. Students "meet" a variety of community members to better understand the concerns and priorities of different groups such as small business owners and medical professionals. They combine the scientific and human considerations of an outbreak with the complex nature of a public health crisis as they create short- and long-term plans for the community.