

Unit Flow Chart Biotechnology / Crowdsourcing Innovations in Biotechnology

YEARS	YEAR 1				YEAR 2			
	Crowdsourcing Innovations in Biotechnology	Taking Action in Your Community: Health Equity	Nucleic Acids and Proteins: Disease Treatment Innovations	Unit Name Lorem Ipsum	Unit Name Lorem Ipsum	Unit Name Lorem Ipsum	Unit Name Lorem Ipsum	Unit Name Lorem Ipsum

LESSON PLANS

Problem Introduction	Cell Biology and Biomarkers	Mitosis and Meiosis	Errors in Cell Replication	Cell Damage	Culturing Cells	Infectious Diseases	Chronic Diseases	Diagnosing Diabetes	Data Generated by Healthy and Diseased Patients	Current Wearable Devices and Data	Statistically Significant Biomarkers	Mock Wearable Tech Innovation Project (PBL)
<i>Learn about crowdsourcing and how it is used to solve real-world problems</i>	<i>Learn cell types, organelle function, and how biomarkers can be indicators of disease</i>	<i>Discover how cells divide and the potential consequences of errors in cell division</i>	<i>Identify genetic mutations and explain how mutations can cause diseases such as cancer</i>	<i>Explore how changes in the cell can cause disease and how biomarkers can be indicators of cellular damage.</i>	<i>Learn about the use of cell lines in research and debate the ethical implications of using cell lines</i>	<i>Compare infectious and chronic diseases and learn what types of biomarkers indicate a viral infection</i>	<i>Explore ways that wearable technology can help patients manage and prevent chronic disease</i>	<i>Play the role of lab technicians to learn how a patient is diagnosed with diabetes using biomarkers</i>	<i>Explore ways that biomarker data can be used and privacy issues pertaining to medical information</i>	<i>Examine current wearable technology, the development of these products, and their impact on human health</i>	<i>Causality and correlation and the impact this can have on how medical data is interpreted</i>	<i>Students work in teams on a piece of wearable tech that can identify biomarkers of a specific disease</i>
2 DAYS	2 DAYS	3 DAYS	4 DAYS	5 DAYS	4 DAYS	4 DAYS	4 DAYS	4 DAY	3 DAYS	2 DAYS	2 DAYS	3 DAYS

INSTRUCTIONAL ACTIVITIES	Cell Type Graphic Organizer	Mitosis Lab	Find the Mutation Activity	Disease Awareness Activity	Bioethics Argument Graphic Organizer	Disease Case Study	Social Awareness Campaign Poster	Instructional Activity Heading or Title Here	Instructional CER	Multimedia Presentation on Wearable Tech	Correlation vs. Causation Meme or Poster	Instructional Activity Heading or Title Here
	<p><i>Student work together to create a graphic organizer that explores cell types and organelle functions</i></p> <hr/> <p>Slide Video</p> <p><i>Student work in teams to create an informational video about cells and how the biomarkers they produce can indicate disease</i></p>	<p><i>Students complete a virtual lab to learn about the stages of mitosis.</i></p> <hr/> <p>Meiosis Notes Organizer</p> <p><i>Students research and view the process of meiosis</i></p> <hr/> <p>Mitosis and Meiosis Venn Diagram</p> <p><i>Students compare and contrast the two types of eukaryotic cell division</i></p>	<p><i>Students look for mutations in DNA sequences while simulating transcription and translation</i></p> <hr/> <p>Cell Cycle and Cancer Lab</p> <p><i>Students calculate and compare the mitotic rate of healthy cells and cancer cells</i></p> <hr/> <p>Richard's Diagnosis</p> <p><i>Students play the role of medical professionals to diagnose a young man with a genetic disease</i></p>	<p><i>Students choose to write a letter or create a TikTok video to bring awareness to disparities in Sickle Cell Funding</i></p> <hr/> <p>Disease Innovation Product Pitch</p> <p><i>Students use biomarkers to help design a device to help someone diagnosed with Multiple Sclerosis</i></p>	<p><i>Students examine the ethics of patenting genetic and cellular material</i></p> <hr/> <p>Stem Cell Donation Poster</p> <p><i>Students work in teams to create a digital poster to combat disparagies in medical research</i></p> <hr/> <p>Cell Culture Technican Interview Questions</p> <p><i>Students write questions they would ask a specialist in working with cell cultures</i></p>	<p><i>Students collaborate to write and present a fictional case study for a disease</i></p> <hr/> <p>Infectious Disease Infographic</p> <p><i>Students work together to create an infographic detailing information about a fictional disease and the biomarkers associated with it</i></p>	<p><i>Students create a poster that will inform the public about a chronic disease</i></p> <hr/> <p>Chronic Disease Data Slideshow</p> <p><i>Student pairs use data from the CDC to create a slideshow about the prevalence of chronic disease in the US</i></p>		<p><i>Activity Students use evidence and reasoning to support the claim: There are racial disparities in healthcare. This is then presented in poster form.</i></p>	<p><i>Students create a presentation using technology that conveys how wearable tech can be used to track infectious disease outbreaks and help those with chronic disease</i></p> <hr/> <p>Simple Circuit Design and Build</p> <p><i>Students design and build a circuit and brainstorm how it could be used in a piece of wearable technology</i></p>	<p><i>Students create a humorous meme or poster to show their understanding of the difference between causation and correlation</i></p> <hr/> <p>Tuskegee Poster</p> <p><i>Students design and present a poster detailing their thoughts about the impact of the Tuskegee Syphilis Study</i></p>	<p><i>Students learn lorem ipsum dolor sit amet consectetur adipiscing elit in nonum erat suma</i></p> <hr/> <p>Activity Heading or Title Here</p> <p><i>Students learn lorem ipsum dolor sit amet consectetur adipiscing elit in nonum erat suma</i></p> <hr/> <p>Activity Heading or Title Here</p> <p><i>Students learn lorem ipsum dolor sit amet consectetur adipiscing elit in nonum erat suma</i></p>