

Unit Flow Chart CTE Biotechnology Pathway

YEARS		YEAR 1				YEAR 2			
		Crowdsourcing Innovations in Biotechnology	Taking Action in Your Community: Health Equity	Nucleic Acids and Proteins: Disease Treatment Innovations	Behind the Scenes of Scientific Breakthroughs	Solution Seeking Microbes	Alternative Proteins	Plants to Pharmaceuticals	Community Science
LESSON PLANS									
Problem Overview	Epidemiology	Current Infectious Diseases	Treating Bacterial and Viral Disease	New Production Methods	Manufacturing Medicine	Using ELISA in Vaccine Trials	Vaccine Production and Safety Testing	Public Health Agencies	Social Awareness Campaign Project (PBL)
<i>Discover how pandemics are mitigated, then determine ways to address disparities and access to healthcare.</i>	<i>Work as epidemiologists, using data to identify populations vulnerable to adverse health events.</i>	<i>Compare various infectious diseases and the risks that humans face from pathogens.</i>	<i>Examine cell and viral reproduction and various treatments for different diseases.</i>	<i>Work as microbiologist, exploring how vaccines work and are produced in a laboratory.</i>	<i>Study viral reproduction in the lab, examining challenges in the production of vaccines.</i>	<i>Conduct research on COVID-19 approved vaccines to identify antibody levels for immunity.</i>	<i>Research the stages a vaccine must go through in order to be used by the public.</i>	<i>Study government involvement in vaccine development, considering hurdles of disadvantaged people.</i>	<i>Work in teams to launch a campaign that raises awareness and provides information in a pandemic.</i>
40 DAYS	5 DAYS	5 DAYS	4 DAYS	4 DAYS	3 DAYS	5 DAYS	5 DAYS	5 DAYS	3 DAYS
INSTRUCTIONAL ACTIVITIES	Disease Poster and Presentation <i>Students work together to create and present a poster that informs the audience about a major epidemic in human history.</i> <hr/> Informative Video <i>Student teams create a video that explains how data can be used to predict where the next major epidemic might occur.</i>	Infectious Disease Powerpoint <i>Students create an informative powerpoint focusing on a particular pathogen.</i> <hr/> Multiplying Microbes <i>Students calculate the growth rate of bacteria and learn what can influence bacterial growth and spread.</i> <hr/> Disease Transmission Lab <i>Students participate in a simulation showing how a disease can spread from person-to-person and practice and how patient zero can be discovered.</i>	Bacterial Disease Poster <i>Student groups create a poster highlighting one bacterial disease and treatments used against it.</i> <hr/> Disparities in the Treatment of Infectious <i>Students review journal abstracts and create a graph showing disparities in treatment of disease and brainstorm solutions.</i>	Microbiologist Concept Map <i>Students research the requirements of and job duties of a microbiologist and create a graphic organizer.</i> <hr/> DNA/RNA Activity <i>Students compare and contrast the structure and function of DNA and RNA and learn how this is important in vaccine development.</i>	Sequence Logic Game <i>Logic Game Students create cards that must be placed in the correct sequence of vaccine development and production.</i> <hr/> How are Pathogens Grown? <i>Students will compare the various ways that pathogens and antigens are grown in a microbiology lab in vaccine development .</i>	Mock ELISA Test <i>Students measure antibody levels in clinical trial participants, determining the concentration of each participant's IgG antibodies to SARS-CoV-2 spike protein after vaccination.</i>	Letter to Clinical Trial <i>Students compose a letter explaining the importance of collecting data from people of color in clinical trials.</i> <hr/> Vaccine Poster/Flyer <i>Students work in small groups to research and create a poster or flyer about the benefits and safety concerns of a common childhood vaccine.</i>	Encouraging Vaccination <i>Students create an informational piece that will encourage vaccination for all people, including people faced with a lack of equity in healthcare.</i> <hr/> Vaccination Flowchart <i>Student pairs conduct research and create a flowchart that shows the steps of the vaccine approval process.</i>	Website <i>Students create a mock social media platform to reach their target audience and encourage community members to seek equity and demand equality in healthcare so that all people have access to information and medical treatment.</i> <hr/> Campaign <i>Students design an interactive ad or infographic that identifies the problem, create a short PSA video to raise awareness and develop social media components to educate the public and spread awareness.</i>