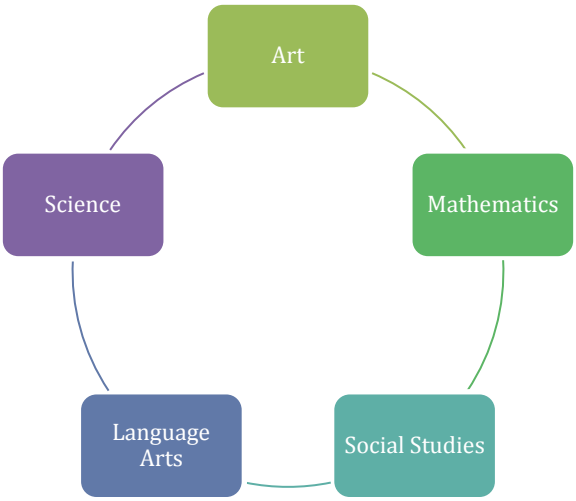
STEM School Chattanooga
9th Grade PBL
Unit Plan Template

Unit 6: Medicine - Viral Outbreak



Learning Target Topics

Art I: Choose and apply subject matter to communicate an idea; Create artwork that reflects how history and culture influences art.

Algebra I: Interpret expressions for function; Solve systems of inequalities.

Geometry: Find Arc lengths and areas of sectors of circles; apply geometric concepts in modeling situations.

English I: Write narratives to develop real or imagined events; Make strategic use of digital media in presentations; Adapt speech to a variety of contexts and tasks.

Physical World Concepts: Distinguish and identify each of the components of an atom and describe its structure; Describe radioactivity and half-life and use it to describe the process of nuclear decay; Describe fission and fusion of the atomic nucleus.

World History: Establish credible claims with supporting evidence and counter arguments.

Grade Level	9th Grade	Unit Length	5 Weeks
Unit Overview	The Unit 6 PBL on Medicine will introduce students to the essential concepts of infectious diseases and their spread, including the use of nuclear medicine and vaccines in treatment and prevention. Students will use critical thinking skills to predict the spread of a "zombie virus", creating a quarantine area based on the Chattanooga area. Students will also participate in a Press Conference halfway through the unit, where the group will present their response plan to the zombie virus outbreak and the plans for containment and resolution of the outbreak. By the end of the unit, the groups will create a video news broadcast about the outbreak and write a report on ethical issues that arise from disease outbreaks.		
Unit Essential Issue	• **Problem:** Develop and present a response plan to control and resolve a viral zombie apocalypse.		
Culminating Events	For the Unit 6 PBL, students will work collaboratively in a 5-6 member "Emergency Management Team", consisting of the following team member roles: • CDC/Medical Team • Media/Public Communication • Military/Public Safety Student teams will use the given Zombie Virus disease scenario to develop and present a response plan during the mid-unit Press Conference the week of March 14. The response plan will include information about the spread of the disease, quarantine and containment, diagnosis and prevention, and a plan for resolution. After the plan is approved, the EMT will write a report on a chosen ethical issue based on the virus event as well as create a video news broadcast about the event, plan, and suggestions for public safety that will be part of the culminating presentation during the week of April 13th. The groups will randomly choose a position on the		

following ethical topics for the report:

- State of Emergency - How prepared is the country for this type of event?
- Human rights - Would basic human rights still apply to the infected?

The following items will be assessed by the appropriate content area teacher:

- Math (Algebra I and Geometry): Learning targets will be assessed in the press conference script and presentation.
- Physical World Concepts: Learning Targets will be assessed in the written plan.
- English I: Learning Targets will be assessed in the video news broadcast storyboard and video.
- Art: Learning Targets will be assessed through the digital propaganda poster in the video broadcast.
- History: Learning Targets will be assessed through a written report on a chosen ethical topic.

Common Assessment

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STEM PBL Rubric

PBL Unit 6: Medicine
Student: _____
Date: _____

	Advanced	Proficient	Needs Improvement
Math Components: **Algebra I**	• Based on the data provided in the attached scenario and calculations determined at the proficient level, students will determine and justify the best use of resources to prevent and/or cure the virus.	• Students will use an exponential formula to predict the number of infected citizens at day 3,7,14,21 and 30. • Students will create and solve a system of inequalities to determine the range of possible treatment plan options.	
Math Components: **Geometry**	• Based on data provided in the scenario and calculations from the proficient level, students will determine and justify locations to quarantine infected citizens.	• Students will determine the circumference and area of Chattanooga in miles based on data provided in the attached scenario. • Students will divide a map of Chattanooga into sectors and will calculate the area of the sectors.	
Science Components: **Physical World Concepts**	• Using a desired outcome (provided in the scenario), students will give a resolution to the infection and defend it using a principle of vaccination, treatment, or nuclear annihilation.	• Students will discuss the results of a nuclear weapon in the terms of alpha, beta, and gamma decay and their equations.	
Language Arts Components: **English I**	• Students will create the video in the format of a news broadcast, including news anchors and interviews with experts. • The images and graphics used in the video are effective in explaining the progression, timeline, and resolution of the virus event. • The elements of the video broadcast flow together to tell the narrative of the virus event, including the technical and personal elements of the apocalypse. • The video news broadcast is creative and innovative, using editing techniques and special effects to add interest and detail.	• Students will use speech and vocabulary specific to the news broadcasting field and topics being discussed. • The video news broadcast should include appropriate images and graphics to enhance the information and add interest. • The video news broadcast includes participation from all 3 team roles to describe the disease event, plan, and public safety suggestions about the Zombie Apocalypse. • The storyboard should plan all elements of the news broadcast, including graphics, anchor text, images and video clips, as well as identifying names of group members and roles.	
Social Studies Components: **World History**	• Introductions must excite the audience to action and present a clear, concise thesis. • Evidence use flows with the claims and analysis of team members and experts using multiple sources to	• Introductions must grab the audience's attention and create a thesis statement that is clear to the topic. • Paper must use sources for evidence and call on a	

		back claims. • Conclusion creates a call to action and convinces audience members to side with team's view.	combination of the words of experts with analysis from the team. • Conclusion must convince the audience that the team's side is stronger than the opponent's.	
	Art Components: **Art I**	• The propaganda poster is effective creating a specific tone and invoking a strong emotion in the audience. • The propaganda poster is incorporated into the video broadcast effectively as part of the narrative about the virus outbreak.	• Students will create a digital propaganda poster that is either pro- or anti-"zombie", meant to influence the opinions of the public. • The elements of the poster are creative and appropriate for the purpose of spreading propaganda about the virus outbreak event.	
	Minimum Requirement Components: **Must be included to be graded**	Algebra 1: • All calculations must be included in the press conference report. Geometry: • All calculations must be included in the press conference report. English I: • The storyboard must be submitted for approval at the mid-unit Press Conference. • The news broadcast video is to be between 1-3 minutes in length. PWC: • The required pieces must be included in the written plan. World History: • Teams must have a paper turned in through digital means before culminating event. • Teams use one of the two topics. • Teams must contain at least 2 citations from reputable sources. Art: • The digital propaganda poster needs to be included in the video broadcast.		
Unit Learning Targets	Algebra 1: • I can interpret expressions for functions in terms of the situation they model. • I can solve systems of inequalities. Geometry: • I can find arc lengths and areas of sectors of circles. • I can apply geometric concepts in modeling situations. English I: • I can write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. • I can make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. • Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. Physical World Concepts: • I can distinguish and identify each of the components of an atom, and describe its structure. • I can describe radioactivity and half-life, and use it to describe the process of nuclear decay. • I can describe fission and fusion of the atomic nucleus. History: • I can establish and support substantive and credible claims. • I can analyze the work of others to support a claim. • I can, with organization and structure, support claims while answering counter arguments. • I can persuade others to an argumentative claim and create a call-to-action from an Art: • Choose and apply subject matter and symbols to communicate an idea. • Create an artwork using specified subject matter, symbols, and/or ideas. • Create a work of art that reflects an understanding of how history or culture influences a work of art.			

Vocabulary	

Math: Algebra I	1. Exponential Function 2. Exponential Growth 3. Exponential Decay
Math: Geometry	1. Arc 2. Chord 3. Major Arc 4. Minor Arc 5. Semicircle 6. Sector
Science: Physical World Concepts	1. Alpha Decay 2. Beta Decay 3. Gamma Decay 4. Half-life 5. Fission 6. Fusion 7. Nuclear 8. Proton 9. Neutron 10. Electron
Language Arts: English I	1. Lead 2. Anchor 3. Voice Over/Sound Over Tape 4. Feature Story 5. Hard News Story
Social Studies: World History	1. Claim/Counter Claim 2. Persuasive Strategy 3. Evidence Analysis 4. Research Design
Art: Art I	1. Propaganda 2. Cultural Influence