

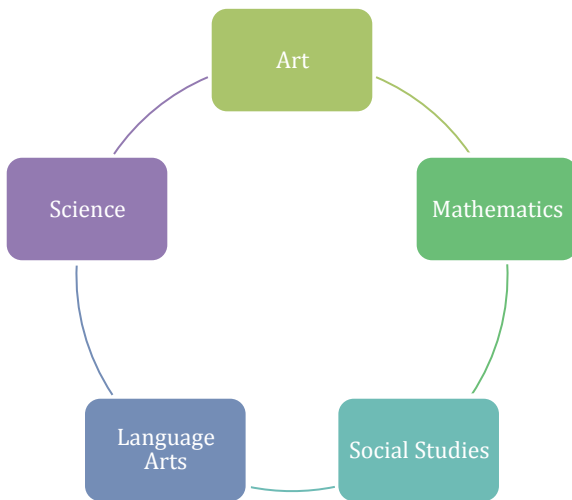
STEM School Chattanooga

9th Grade PBL

Unit Plan Template

Unit 4: Gaming

Learning Target Topics



Art I: Choose and apply subject matter and symbols to communicate an idea. Analyze the origin and significance of subject matter, symbols, and/or ideas in a work of art.

Algebra I: Interpret functions that arise in applications in terms of the context.

Geometry: Experiment with transformations in the coordinate plane.


English I: Determine meanings of words and phrases. Produce writing appropriate to audience, task, and purpose. Use technology to produce writing and display information.

Physical World Concepts: Define, describe and calculate energy. Describe and distinguish among the behaviors of energy as waves. Explain the observable phenomena of light and sound energy.

World History: Present information, findings, and supporting evidence. Create strategic use of digital media in presentations. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.

Grade Level	9 th Grade	Unit Length	3 Weeks
Unit Overview	The Unit 4 PBL on Gaming will introduce students to the essential concepts underlying the principles of light, sound, and electromagnetic waves. Along with the study of various types of waves, students will apply creativity and critical thinking to collaboratively design and develop an original video game using one of three optional platforms. Within the game, students will create movement through the use of various transformations and will represent the movement in a graphical and tabular format. Students will then market their original video game through a promotional video trailer and group presentation. Students will also analyze the efficiency of the game design through their marketing group presentation.		
Unit Essential Issue	Problem: Develop a new platform for gaming in the future through the creation of an original video game.		
Culminating Events	<p>For the Unit 4 PBL, the students will work collaboratively in groups of 4. Student teams will design and develop an original video game, using one of the three choices of game creation platforms. They will also create a video trailer to promote their new game and market the game, including an evaluation of the design and efficiency of the game, through their group presentation.</p> <p>Presentations – Week of December 15</p> <p>The culminating event for this PBL is a 5-7 minute presentation where students will market their design for their original video game, including original game footage and their promotional trailer. The following items will be turned in as part of the presentation:</p> <ul style="list-style-type: none"> • Video Game Promotional Trailer • Original Video Game • Storyboard for the Video Game 		

	<p>The following items will be assessed by the appropriate content area teacher:</p> <ul style="list-style-type: none"> Math (Algebra I and Geometry): Learning Targets will be assessed both within the presentation and submitted on graph paper with accompanying equations or notations. Physical World Concepts: Learning Targets will be assessed within the presentation. English I: Use of literary devices and propaganda to promote original game design in the video trailer and the explanation of these elements in the presentation. Art: Storyboard to develop the characters, scene and plot. History: Use of marketing strategies and persuasive strategies in the presentation. <p>Creation of an original video game using one of the three choices of game creation software:</p> <ul style="list-style-type: none"> Option 1: Easy coding- Game Star Mechanic: <ul style="list-style-type: none"> - 3-tier built-in game system that will teach students how a video game works, how to edit games, and finally how to create their own game within GSM. Option 2: Medium coding- StarMade: <ul style="list-style-type: none"> - An open sandbox type game that would allow students the freedom to create from scratch a playable universe within StarMade. Option 3: Hard coding- Unity: <ul style="list-style-type: none"> - This is a full video game engine that would allow students the freedom to create from scratch a playable universe of their own creation to contain various models of the PBL required materials.
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Common Assessment			STEM PBL Rubric		PBL Unit: 4 - Gaming Student: _____ Date: _____
		Advanced	Proficient	Needs Improvement	
	Math Components: Algebra I	<ul style="list-style-type: none">Using the table of x and y coordinates related to their graph, students will determine the slope of the lines.Students will write linear equations using the coordinates from their graph.	<ul style="list-style-type: none">Students can sketch a graph and write a situation related to it that describe character or background movement in their game.Students can explain why the graph would be either discrete or continuous.Students will create a table of values that represent the points on the graph.		
	Math Components: Geometry	<ul style="list-style-type: none">Students can create a 3-D representation of the geometric figure.Students can complete one transformation on each of the x, y and z axes and describe the transformations (does not have to be shown in a 3-D plane).	<ul style="list-style-type: none">Students can complete two compositions of transformations in the 2-D coordinate plane related to character or background movement in their game.Students will write the rules of the transformations describing the transformations.		
	Science Components: Physical World Concepts	<ul style="list-style-type: none">Students can explain the movement of sound waves using at least one calculation.Students can explain the behavior of light waves in their game using a calculation for red light, green light and blue light.Students should address the wave-particle duality of light waves.	<ul style="list-style-type: none">Students can describe the propagation of sound waves used in their video game in terms of reflection, refraction and diffraction.Students can describe propagation of sound waves in the game in terms of simple harmonic motion.Students can describe the propagation of electromagnetic waves used in their video game in terms of the electromagnetic continuum, including frequency and wavelength. (Students should specifically address the difference in energy.)		

	Language Arts Components: English I	<ul style="list-style-type: none">Students use the developed tone in the trailer to create a specific mood and emotional response in the intended audience for the purpose of marketing the video game.Students successfully highlight the most desirable elements of the video game through the use of propaganda techniques and game play footage.Students utilize entertaining and innovative video and sound techniques in the video trailer.Students evaluate the effectiveness of the figurative language and propaganda techniques used in marketing the game to the intended audience in a written document submitted with the trailer PBL assignment.	<ul style="list-style-type: none">Students use figurative language in the text, lyrics, or narration to develop the tone and mood of the game trailer through specific word choice.Students use propaganda techniques to create a desire for the product in the identified audience.Students include game play and original elements to make the trailer interesting and engaging.Students identify the propaganda techniques and figurative language used to create tone and mood in the trailer in a written document submitted with the trailer PBL assignment.	
	Social Studies Components: World History	<ul style="list-style-type: none">The target audience for my game and/or gaming platform is presented and there is a clear explanation of why this target audience is the ideal consumer for the product.The presentation is informative and creative, plus there is a memorable element that creates a lasting impression.Student uses vernacular from the gaming industry throughout the presentation without any errors in vernacular usage.	<ul style="list-style-type: none">The target audience for my game and/or gaming platform is presented and there is a clear explanation of why this target audience is the ideal consumer for the product.The presentation is informative and creative.Student uses vernacular from the gaming industry throughout the presentation with minor errors in vernacular usage.	
	Art Components: Art I	<ul style="list-style-type: none">Students sketch a storyboard that highlights major visual details of characters, scenes and the plot outline for the video game. The storyboard contains at least six frames.	<ul style="list-style-type: none">Students sketch two characters in detail with a written explanation of the symbols and ideas used for the characters in at least two storyboard frames.	
	Minimum Requirement Components: Must be included to be graded	<p>English I:</p> <ul style="list-style-type: none">Video trailer must be at least 30 - 60 seconds long and be included in the group presentation.Video trailer must include original poetry or a slogan with at least 1 example each of both a propaganda technique and figurative language.The purpose of the video trailer must be to successfully market the original video game to a specific audience. <p>Art:</p> <ul style="list-style-type: none">Two storyboard frames with character sketches and explanations <p>World History:</p> <ul style="list-style-type: none">The target audience for my game and/or gaming platform is presented but there is no explanation of why this target audience is the ideal consumer for the product.The presentation is informative but not interesting.Student attempts to use vernacular from the gaming industry.All the above will be assessed in the team 5-7 minute presentation at the end of the PBL unit. <p>PWC:</p> <ul style="list-style-type: none">Students must address the propagation of both sound and light waves in the game in terms of at least one of the following: reflection, refraction, and diffraction.Students must discuss the relationship between frequency and wavelength of light waves.Students must include at least one diagram or picture to describe the movement of waves.		
Unit Learning Targets	<p>Algebra 1:</p> <ul style="list-style-type: none">I can interpret functions that arise in the context of a problem or a situation. <p>Geometry:</p> <ul style="list-style-type: none">I can experiment with transformations in the coordinate plane. <p>PWC:</p>			

	<ul style="list-style-type: none"> • I can define, describe and calculate energy. • I can describe and distinguish among the behaviors of energy as waves. • I can explain the observable phenomena of light and sound energy. <p>English I:</p> <ul style="list-style-type: none"> • I can determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings and analyze the cumulative impact of specific word choices on meaning and tone. • I can produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. • I can use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. <p>Art I:</p> <ul style="list-style-type: none"> • I can choose and apply subject matter and symbols to communicate an idea. • I can analyze the origin and significance of subject matter, symbols, and/or ideas in a work of art. <p>World History:</p> <ul style="list-style-type: none"> • I can present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. • 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. • I can adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. 												
Vocabulary	<table border="1"> <tr> <td>Math: Algebra I</td><td> <ol style="list-style-type: none"> 1. Function 2. Slope 3. Discrete Graph 4. Continuous Graph </td></tr> <tr> <td>Math: Geometry</td><td> <ol style="list-style-type: none"> 1. Transformations 2. Vectors 3. Isometry 4. Compositions </td></tr> <tr> <td>Science: Physical World Concepts</td><td> <ol style="list-style-type: none"> 1. Reflection 2. Refraction 3. Diffraction 4. Harmonics 5. Electromagnetic 6. Photons 7. Transverse 8. Longitudinal </td></tr> <tr> <td>Language Arts: English I</td><td> <ol style="list-style-type: none"> 1. Propaganda/Persuasive techniques 2. Tone and Mood 3. Figurative Language 4. Parallelism 5. Word Choice </td></tr> <tr> <td>Social Studies: World History</td><td> <ol style="list-style-type: none"> 1. Marketing 2. Persuasive Techniques 3. Formal Language </td></tr> <tr> <td>Art: Art I</td><td> <ol style="list-style-type: none"> 1. POV - Point of View Shot 2. Master Shot 3. Long Shot </td></tr> </table>	Math: Algebra I	<ol style="list-style-type: none"> 1. Function 2. Slope 3. Discrete Graph 4. Continuous Graph 	Math: Geometry	<ol style="list-style-type: none"> 1. Transformations 2. Vectors 3. Isometry 4. Compositions 	Science: Physical World Concepts	<ol style="list-style-type: none"> 1. Reflection 2. Refraction 3. Diffraction 4. Harmonics 5. Electromagnetic 6. Photons 7. Transverse 8. Longitudinal 	Language Arts: English I	<ol style="list-style-type: none"> 1. Propaganda/Persuasive techniques 2. Tone and Mood 3. Figurative Language 4. Parallelism 5. Word Choice 	Social Studies: World History	<ol style="list-style-type: none"> 1. Marketing 2. Persuasive Techniques 3. Formal Language 	Art: Art I	<ol style="list-style-type: none"> 1. POV - Point of View Shot 2. Master Shot 3. Long Shot
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