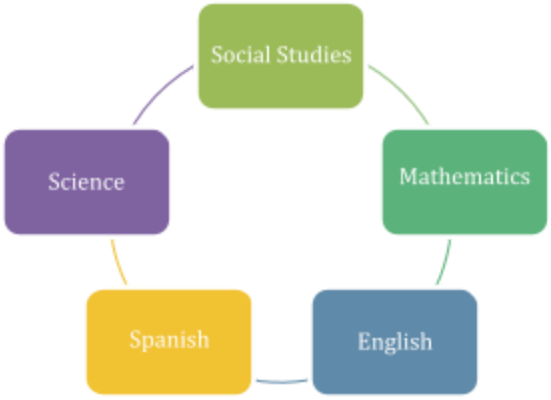
STEM School Chattanooga
10th Grade PBL
Unit 3

Unit 3: Unum- HTML, CSS, and JavaScript



Learning Target Topics

Algebra II: Demonstrate an understanding of radical equations and functions.

Geometry: Demonstrate an understanding of the properties of quadrilaterals and how to use them to solve problems.

English II: Demonstrate command of the conventions of standard English grammar and usage

Chemistry: Demonstrate a grasp of periodic trends, atomic models, and distinguishing among elements, compounds, and mixtures

U.S. History: Determine central ideas from source documents and evaluate various explanations for historical events

Spanish: Demonstrate a command of basic Spanish grammar rules

Grade Level	10th Grade	Unit Length	6 Weeks
Unit Overview	Students will use the LRN application to learn HTML, CSS, and JavaScript with varied coding logic principles. Students will apply their foundational computer language skills to create and build a web based application for each content area. Students will work with identified student coding experts throughout the unit instead of technical expertise coming from the faculty. The unit will conclude with groups participating in a coding challenge competition at the school created by Unum staff and student experts. The top groups in the school-based competition will then be invited to compete in a similar coding challenge against Unum employees at Unum's headquarters for viewing by all Unum employees.		
Unit Essential Issue	**Problem**: *How do we, as software developers, develop a fully functioning web application?*		
Kick Off Event	**Kick Off - January 16, 2018** Student Coding Professionals will lead all 10th grade students in an activity. **Unum Trip - January 31, 2018** Students will go to Unum headquarters in Chattanooga to learn more about HTML/CSS/Java for their PBL project.		

<table>
<tr><td>Culminating Events</td><td>Turn-in day – Friday, February 16, 2018
App: Teams will upload completed app to GitHub via the GitToGo app then submit the link to “10th Grade General” in Google Classroom.

Competition – Wednesday, February 21, 2018
Teams will compete against each other at the STEM School, completing coding challenges for HTML, CSS and JavaScript based on what they learned in the LRN and SoloLearn applications.

Unum Competition – TBD
The top teams from the STEM coding competition will then compete at Unum in their showcase competition.</td></tr>
<tr><td>Common Assessment</td><td>Students will receive two grades for this PBL: one individual, one group.

Individual Portion
Students will complete LRN app for HTML, CSS, and JavaScript and complete quizzes for each language. The PBL individual grade will be assessed as follows:
● BB (below basic): Lowest score on quizzes is BB
● PR (proficient): Lowest score on quizzes is PR
● AD (advanced): Lowest score on quizzes is AD

Group Portion
In groups of three, students will work together to write a review web app for each class. The attached rubric will be used to assess group PBL performance and grade. Content area grades for the group will be assigned as follows:
● PR: All content areas meet Proficient requirements
● AD: All content areas meet Proficient requirements and Advanced requirements are met
Any content areas that do not meet Proficient requirements must be remediated.

<table>
<tr><td>STEM School Chattanooga</td><td colspan="2">STEM PBL Rubric</td><td>PBL Unit:#3- Unum
Student: _____
Date: _____</td></tr>
<tr><td></td><td>Advanced</td><td>Proficient</td><td>Needs Improvement</td></tr>
<tr><td>Math Components:
Algebra II/Geometry</td><td>● Code a quiz for each of the math areas.
○ If answered correctly, the next question is displayed.
○ If answered incorrectly, an explanation with additional examples is displayed, then returns to the previous question.
● Must have two questions for each math area for a total of six (6) questions.</td><td>● Do either Geometry or Algebra 2 (not both) based on the majority of members in your group.
● Build a quiz web app that reviews the following math learning targets accurately and correctly.:
● Geometry: Quadrilaterals
○ Classifying Quadrilaterals
○ Use coordinate geometry to prove a classification
○ Using properties of quadrilaterals to solve problems
● Algebra 2: Radical Expressions
○ Simplifying Expressions
○ Solving Equations (including extraneous solutions)
○ Graphs of radical functions</td><td></td></tr>
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	Science Components:
	Chemistry
		• Code a quiz for each of the Chemistry areas.
		  ○ If answered correctly, the next question is displayed.
		  ○ If answered incorrectly, an explanation with additional examples is displayed, then returns to the previous question.
		• Must have two questions for each Chemistry area for a total of six (6) questions.
			• Build a quiz web app that reviews the following Chemistry Learning Targets accurately and correctly:
			  ○ Compare and contrast the major models of the atom (i.e., Bohr, Rutherford, and the quantum mechanical model)
			  ○ Compare and contrast the trends found in the periodic table with respect to atomic size, ionization energy, and electronegativity
			  ○ Distinguish among elements, compounds, and mixtures	

	Language Arts Components:
	English II
		• For each grammar question, quiz app should:
		  ○ Display the next question if the question is answered correctly.
		  ○ Display an explanation of correct usage, with different examples, if the question is answered incorrectly – then return to the previous question.
		• Must have two questions for each grammar area for a total of six (6) questions.
			• Build a quiz web app to review the following grammar topics accurately and correctly:
			  ○ Identifying the difference between a fragment and a complete sentence.
			  ○ Understanding comma splices, semicolons, and colons.
			  ○ Understanding subject and verb agreement with intervening phrases.	

	Social Studies Components:
	U.S. History
		• Code a quiz for each of the history areas.
		  ○ If answered correctly, the next question is displayed.
		  ○ If answered incorrectly, an explanation with additional examples is displayed, then returns to the previous question.
		• Must have 3 questions each for the broad topics of Pre-WWII, During WWII, and Post-WWII..
			• Build a quiz web app to review the following history topics:
			  ○ People of Note during WWII
			  ○ Events Pre-, During, and Post-WWII
			  ○ Understandings or Ideas of WWII
			  ○ Understanding of Advances in Technology used by both the Allied and Axis Powers.
			• Displays citation with a sentence or two more to give the student more understanding of the topic.	

	Foreign Language Components:
	Spanish
		• Code a quiz for each of the Spanish grammar areas.
		  ○ If answered correctly, the next question is displayed.
		  ○ If answered incorrectly, an explanation with additional examples is displayed, then returns to the previous question.
			• Build a quiz web app to review the following Spanish topics accurately and correctly:
			  ○ Understanding when and how to use the Spanish grammar rules
			  ○ Dealing with numbers: El calendario, Que hora es, Las Matematicas	

		● Must have two questions for each Spanish area for a total of six (6) questions.	○ Understanding how to conjugate AR, ER, IR verbs in the present tense.	
	Minimum Requirement Components: **Must be included to be graded**	General Requirements: ● All web applications must be built using HTML, CSS, and JavaScript. ● All questions and answers must be original. (No "copypasta") History: ● All questions and answers must be accompanied with citations in MLA format. Spanish: ● Grammar questions must be signed off by Sra. Polk.		

Unit Learning Targets

Algebra 2:

- I can simplify rational exponent expressions.
- I can compare and contrast key features of functions.
- I can find complex solutions of 1-variable equations and determine if any are extraneous.

Geometry:

- I can use properties of quadrilaterals to solve problems.

Chemistry:

- I can describe the trends found in the periodic table with respect to atomic size, ionization energy, and electronegativity
- I can distinguish among elements, compounds, and mixtures
- Compare and contrast the major models of the atom (i.e., Bohr, Rutherford, and the quantum mechanical model)

English:

- I can use various types of phrases and clauses to convey meaning and add variety and interest to my writing.
- I can use a semicolon to link two or more related independent clauses.
- I can use a colon to introduce a list or quotation.

History:

- I can evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.

Spanish

- I can identify and utilize proper Spanish grammar components in appropriate context.
- I can use proper grammar vocabulary to explain how to use basic Spanish grammar rules and functions.

Vocabulary			Spanish translation
	Math: Algebra II	1. Square root 2. Cube Root 3. Exponent 4. Function 5. Equations 6. Expression 7. Simplify	
	Math: Geometry	1. Parallelogram 2. Quadrilateral 3. Rectangle 4. Square 5. Trapezoid 6. Kite 7. Rhombus 8. Diagonal 9. Parallel 10. Bisect	
	Science: Chemistry	1. Bohr Model 2. Rutherford Model 3. Quantum Mechanical Model 4. Atomic Size 5. Ionization Energy 6. Electronegativity 7. Elements 8. Compounds 9. Homogeneous Mixture 10. Heterogeneous Mixture	
	Language Arts: English II	1. Independent Clause 2. Intervening Phrase	
	Social Studies: U.S. History	1. Evaluation 2. Reasoning 3. Textual 4. Information 5. Markup Language	
	Spanish	1. Grammar 2. Definite articles 3. Indefinite articles 4. Pronouns 5. Direct object (pronouns) 6. Indirect object (pronouns) 7. Conjugations 8. Present Tense 9. Verbs	1. Gramatica 2. Articulos definidos 3. Articulos indefinidos 4. Pronombres 5. Objetos directos 6. Objetos indirectos 7. Conjugaciones 8. Tiempo presente 9. Verbos