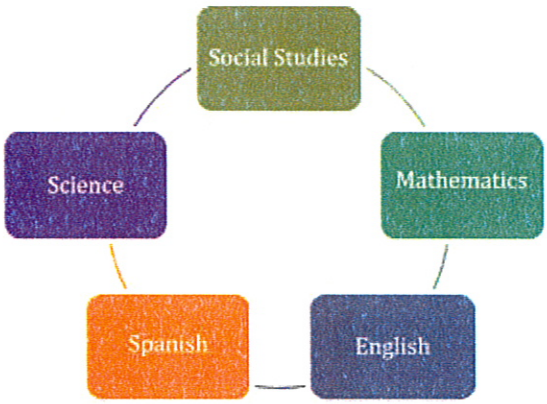
STEM School Chattanooga

10th Grade PBL

Unit Plan Template

Unit 1: Hunter Museum Partnership – Innovating Art



Learning Target Topics

Algebra II: Sequences & Series

Geometry: Geometric Definitions

English II: Present findings along with supporting evidence, in a way that the audience can understand and easily follow

Chemistry: Understanding the Periodic Table

U.S. History: Present an oral defense of artistic value in comparison to the original art piece

Spanish: Present information in Spanish about the author's nationality, theme, techniques, visual features and date of the art piece.

Grade Level	10th Grade	Unit Length	9 Weeks
Unit Overview	Students will research an art piece from the Hunter Museum of Art in Chattanooga, TN. They will investigate the historical time period and influences on the artists and art piece. They will create an original **digital** or **3-D printed piece** based on their interpretation of the original piece. Student products will include analyzing the composition of their chosen art piece, investigating the Periodic Table, and presenting their chosen piece in Spanish. At the Hunter museum, students will then act as docent and present how their digital interpretation has both a connection and influence, visual and non-visual, to the original piece.		
Unit Essential Issue	**Problem**: Students will use digital tools to reinterpret a piece of art.		
Kick Off Event	**Delivery - Tuesday, August 23** 10th grade students will explore the connections and differences between "digital" and "analog," by participating in three exploratory stations. **Kick Off – Thursday, August 25** 10th grade students and teachers visit the Hunter Museum from 10am to 12pm. Hunter Museum staff provide a tour of the museum. This tour provides students with a basic understanding of the different genres in the museum as well as models the type of discussion/interaction expected of a docent. After the tour, student teams will then move around the museum identifying art pieces they want to use for the PBL.		

Practice Run – Thursday, September 22
10th grade students and teachers visit the Hunter Museum from 10am to 12pm. Student teams set up at their art piece location. This is practice for the first free Sunday in October to make sure students are ready to communicate professionally and meaningfully with the public. STEM teachers and museum staff will walk around the museum in order to provide feedback to each team.

Student Teams
Students will work in teams of 3-4. The students will choose teams and every team must have at least one Algebra II and one Geometry student.

Culminating Events

Deadline Day – Thursday, October 6
The following items are due to the appropriate content area teacher:

- **Algebra II**: Groups will turn in a pixelated copy of their chosen art piece with an equation, a copy of the chosen art piece with COVM highlighted, and a written explanation in MLA format (combined with Geometry).
- **Geometry:** Students will have posted their answers to EDCITEment lessons in Google Classroom, and will turn in a Geometric sketch of their chosen art piece and a written explanation in MLA format (combined with Algebra II).
- **Chemistry:** Students will write and film an interview with the "artist" of their piece. In their interview they will discuss the elements found in either their original piece or the group designed piece.
- **English II**: Groups will turn in a final script of their docent talk. Students will also turn in a written reflection about the project.
- **Spanish I**: Groups will turn in a final script in Spanish of their docent talk and a written reflection in English about the project to their Spanish teacher.

Docent Day – Thursday, October 6
Student teams will come to the Hunter Museum of Art on the first free Sunday in October. Student teams will set up their innovative piece next to the original art piece in the museum. Teams will stay with these art pieces and act as docents for visitors to the museum. Teams will stay for one hour.

U.S. History: Students will research art pieces, comparing and contrasting their historical influences. Teams will also show how the digital representation has visual and non-visual influences coming from the original piece. Teams will design an argument for the value of their selected art piece and how their interpretation represents that value. The US History teacher will visit each team for team's US History presentation. A 3-5 minute oral presentation should be ready for US History requirements.

Common Assessment

STEM School Chattanooga

STEM PBL Rubric

PBL Unit: #1 – Hunter Museum
Student: _____
Date: _____

	Advanced	Proficient	Needs Improvement
Math Components: **Algebra II**	● An appropriate focal point for the *chosen* piece is highlighted on same copy . ● A second copy of the sketch made for the Geometry portion is included in report, highlighting where the COVM and focal point are. ● Using the Geometry section of the project as a guide, compositional locations of COVM and focal point are discussed in the technical report. ● (*cont'd on next pg*)	● Estimate of the center of visual mass (COVM) for the *chosen* piece is reasonable. ● Rationale for each part of the equation and its purpose is discussed in technical report. ● Range of possible outputs is discussed and appropriately tied to context in technical report. ● Pixelated image shows the COVM for each row and column of pixels and the overall COVM for the entire	

		● Technical report discusses the effect the relative locations of these points have on the movement of the viewer's eyes.	*chosen* piece. Image is included in report.	
	Math Components: **Geometry**	● A Geometric sketch of the *created* piece is included in report following the same guidelines as for the *chosen* piece. ● Technical report is extended to describe the composition of the *created* piece using appropriate Geometric and Artistic vocabulary. ● Technical report discusses how the composition and structure of your *created* piece is informed by that of the *chosen* piece.	● Lessons 1 & 2 on visual composition from EDCITEment are complete and answers are turned in via Google Classroom. ● Geometric sketch of *chosen* piece shows contents drawn in black and composition lines in a contrasting color. ● Technical report adequately describes and analyzes the composition of your *chosen* piece using appropriate Geometric and Artistic vocabulary discussed in class.	
	Science Components: **Chemistry**	Include the following in your interview: ● Explain and evaluate why the artist choose the elements/compounds placed in your piece in regards to the chemical and physical properties that lead to the art pieces aesthetics and longevity. ● Discuss the chemical and physical processes used to produce the piece. ● Predict and explain how you could improve the quality or aesthetics of your art piece if certain elements were changed. ● Interview must meet Advanced level using the Hunter PBL Interview Rubric.	● Write and record an interview with the "artist" who created the art piece using either the original art piece or the group recreated art piece using the Hunter PBL Interview Rubric http://bit.ly/2bqMyDd Include at least the following content: ○ Find and list all of the elements/compounds in your art piece. ○ Analyze the location of the piece (inside/outside of the museum) in terms of its elements/compounds, and the chemical effect on the elements in the art based on its geographical location. ○ Demonstrate knowledge of the Periodic Table: atomic mass, atomic number, number of valence electrons, metal, nonmetal, or metalloid, physical properties, and chemical properties. ○ Interview must meet Proficient level using the Hunter PBL Interview Rubric.	
	Language Arts Components: **English II**	● The student uses formal language throughout and presents a concise and flowing argument.	● Formal language is used however the student slips into informal language. ● Accurately presents disciplinary content	

		• Integrates relevant and accurate content with thorough explanations that demonstrate in-depth understanding. • The presenter obviously prepared a compelling script, rehearsed, demonstrated superior knowledge of the subject matter, and does not read to audience. • Student appears calm and confident. There are no distracting behaviors.	relevant to the prompt with sufficient explanations that demonstrate understanding. • The presenter obviously prepared a script, rehearsed, demonstrated strong knowledge of the subject matter, and does not read to audience. • Student seems calm and confident. Only one or two minor things are noticed, but they are not distracting to the listeners/viewers.	
	Social Studies Components: **U.S. History**	• Thesis is clear and establishes the argument which is fully supported by claims within the argument ○ Student shows both visual and non visual influences that represent an innovative connection to the original piece. • The conclusion establishes a wrap-up of the argument but puts the argument into a larger picture in a socio-economic, political, or cultural aspect. • Students can build upon their presentation through answer of clarifying questions	• Thesis is present and establishes the argument. Claims are present. ○ Student shows both visual and non visual influences that represent an innovative connection to the original piece. • Conclusion wraps up argument. • Students can answer clarifying questions.	
	Foreign Language Components: **Spanish**	• Spanish oral presentation is memorized.	• Make an electronic or physical picture of the piece redesigned and label its physical features. Use this picture along with the oral description of the piece. Presented in class. • Complete sentences in Spanish used to describe the art piece and are grammatically and phonetically correct. • Information about the author's name and nationality, theme, techniques or style, and at least ten visual features with the message behind the feature, and date of the piece.	
	Minimum Requirement Components: **Must be included to be graded**	Algebra II: Pixelated copy of chosen art piece with an equation of own creation. Copy of chosen art piece with COVM. • Appropriately formatted technical report, typed and submitted via Google Classroom. (combined with Geometry). Geometry: • Answers to EDCITEment lessons posted to Google Classroom . • Geometric sketch of chosen art piece is included in technical report • Appropriately formatted technical report, typed and submitted via Google Classroom. (combined with Algebra II). Chemistry: • A written script must be submitted with the interview.		

- Interview must contain at least 10 questions.

English II:
- Script of final presentation with indications of what each team member should speak about
- Reflection which includes
  - a write up of their project, including their names, STEM connections to the piece, and a summary of their digital recreation
  - an image of their project (*cont'd on next pg*).
  - an answer to the question: Did this project help you to better understand the work of art or to better engage with it? How so?

U.S. History:
- Presentation must take place at Hunter Museum
- Presentation must be between three and five minutes
- All group members must speak
- All group members must be prepared to answer questions

Spanish:
- Script of final presentation in Spanish with indications of what each team member should speak about.
  - First draft due 9/22/1
- Reflection which includes:
  - An image of their project
  - An answer in English to the question: How this project has helped you to improve your oral skills in Spanish?

Unit Learning Targets

Algebra II:
- LT11 - Sequences & Series: I can represent patterns using sequences and series.

Geometry:
- LT1 - Definitions: I can use definitions precisely and accurately.

Chemistry:
- I can read the Periodic Table to determine an element's atomic makeup.

English:
- Present my findings along with supporting evidence, in a way that the audience can understand.
- Organize my presentation in a logical way, so that the audience can follow along.
- Communicate my findings in a style that is appropriate, respectful, and interesting.
- Speak in a formal manner, using words that are appropriate for a respectful, academic situation.

History:
- I can orally introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
- I can orally develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.
- I can use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
- I can provide a concluding statement or section that follows from or supports the argument presented.

Spanish:
- I can use words and complete sentences in Spanish to present a basic description about a piece of art.
- I can organize my presentation in a logical way and use Spanish grammar and phonetics correctly, so the hispanic audience can follow along.

Vocabulary

	Spanish translation
Math: Algebra II	1. Center of Mass — centro de masa

	2. Equation 3. Summation 4. Arithmetic Sequence 5. Geometric Sequence 6. Series	ecuación la suma secuencia aritmética secuencia geométrica serie
Math: Geometry	1. Point 2. Line 3. Plane 4. Congruent 5. Transformations 6. Translations 7. Reflections 8. Rotations 9. Dilation 10. Tessellation 11. Symmetry	punto línea plano congruente transformaciones conversiones reflexiones rotaciones dilatación mosaico simetría
Science: Chemistry	1. Atomic Number 2. Atomic Mass 3. Valence Electrons 4. Metal 5. Metalloid 6. Nonmetal	número atómico masa atómica valencia de electrones metal metaloide no metálico
Language Arts: English II	1. Formal Language 2. Poise 3. Script	lenguaje formal compostura guión
Social Studies: U.S. History	1. Thesis 2. Opposing viewpoint 3. Interpretation 4. Artistic Value	tesis punto de vista opuesto