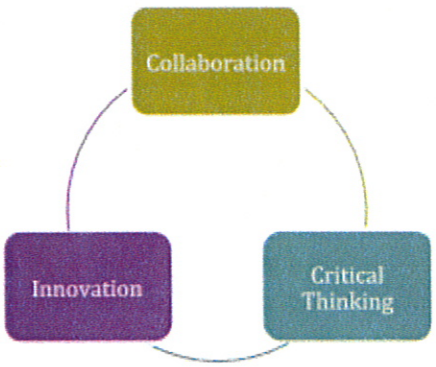
STEM School Chattanooga

10th Grade PBL

Unit 4 Plan

Unit Quarter: 4 - Signal Centers



Learning Target Topics

Collaboration: Holding each person within a group accountable for their actions and attitudes.

Critical Thinking: The continuous process of evaluating ideas and designs.

Innovation: Continuous circuit of improvement, building off of previous ideas.

Grade Level	10th Grade	Unit Length	9 weeks
Industry Partner	The business partner for the Unit 4 10th Grade PBL is Signal Centers. The main contact between STEM and Signal Centers is Megan Grant.		
Unit Overview	Signal Centers mission is to strengthen children, adults and families through services focusing on disabilities, early childhood education and self-sufficiency. STEM students will work with Signal Centers participants to provide and design solutions based upon the various needs of the participants.		
Unit Essential Issue	Choice of one driving question: -How can we, as human resource personnel, design and create a special empathy training for a wheelchair bound individual with cerebral palsy? -How can we, as "imagineers", design and create life-size games suitable for wheelchair bound and physically impaired individuals? (i.e. Kerplunk, Connect Four, Jenga, Scrabble, Pumpkin Slingshot, etc.) -How can we, as structural engineers, design and create a garden/greenhouse suitable for wheelchair bound and physically impaired individuals?		
Kick Off Event	March 6: Signal Centers, their participants and their staff will record a welcome video for STEM students. STEM students will be able to begin gaining empathy for the different participants, their struggles, and their successes. Team Groupings: Students will have the choice of selecting their own group or being placed in a group. Teams will range in size from 3 to 5.		
Culminating Events	STEM School Presentation, April 19: Each STEM group will present their design and their design improvement process to 10th grade and Signal Centers staff. Signal Center Presentation, May 2:		

	STEM groups that are chosen to present, by Signal Centers staff, will present their final design. The final designs will be presented at Signal Centers in front of the participants, their families, and administration staff.

Common Assessment	Students will be scored using the Innovation Rubric and Final Presentation Rubric for STEM III. The students will complete these tasks and products during the PBL:
	1. Assignment (Weekly Prototype Reports)
	2. Final Presentation (5-10 minutes)
	3. Product (Model of Product)
	
	The Weekly Prototype Report:
	• Report Template
	  ○ https://docs.google.com/document/d/1J0501-rG5pX0SR3O5azM_2FAr-JrRfMWOKcijvjXARs/edit
	• Sample Report and Overview of Weekly Prototype Report
	  ○ https://sites.google.com/a/hcde.org/stemschoolfablab/stem-iii-work-products/weekly-prototype-report
	
	The Final Presentation Rubric:
	• https://docs.google.com/document/d/1rRb-gIuDxuF5Gzq2nhHKp45R2Nid2TyEXZo7hwBGj0I/edit
	
	The Innovation Rubric:
	• https://sites.google.com/a/hcde.org/stemschoolfablab/stem-iii-course-info/stem-iii-evaluations-innovation

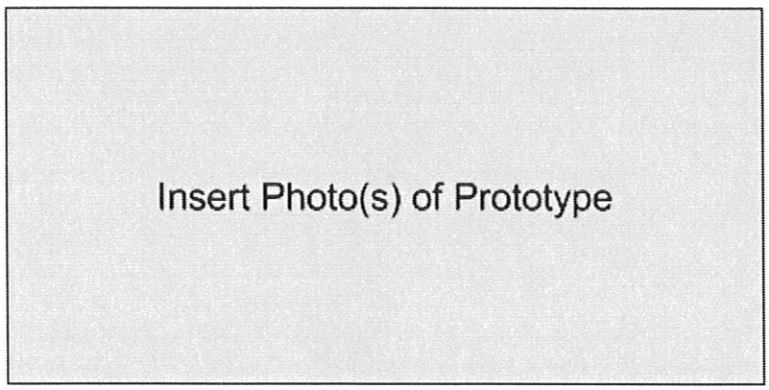
Weekly Prototype Report

Date	
Project	
Team Member	
Team Member	
Team Member	

1. Design Challenge Question for the <u>Entire Project</u>

How might we:

2. Prototype Development and Innovation Rubric Self-Assessment



Acquiring Competencies	Create: Creates an entirely new object, solution or idea that is appropriate to the domain.	Adapt: Successfully adapts an appropriate exemplar to his/her own specifications.	Model: Successfully reproduces an appropriate exemplar.
Place an X in the column(s) which best represent your prototype(s) this week.			

Reflect Evaluate creative process and product using domain-appropriate criteria.	
Taking Risks (1) List specific untested and risky approaches or directions you are pursuing to improve your prototype and (2) describe your progress as you follow through on them	
Solving Problems Explain your upcoming plans (they should be logical and realistic)	

3. Plan for <u>This Week</u>

Team Member	Tasks	Due Date/Time
...		

Signal Centers Project
Final Presentation Rubric

Use this final presentation checklist for the final presentation. You may use your discretion in addressing these areas verbally or with slides.

Your final presentation should reflect your hard work over the quarter. *The most common problem with STEM student presentations: not tailoring your presentation to sponsor expectations and underwhelming them by not including supporting information. Each sponsor is different but they all have given a lot of thought to their field of work and expect you to do so as well. Your project should not look like it could have been accomplished in a week.*

Evaluation Rubric

Advanced (4)
Final Presentation Items: Final presentation items clearly and comprehensively addressed with minor exceptions.

Proficient (3)
Final Presentation Items: Final presentation items are generally addressed and understanding is not seriously impeded by omissions.

Below Basic (2,1,0)
Final Presentation Items: Many final presentation items not addressed or solutions were undefined, ambiguities unexplored, boundaries undetermined.

	Final Presentation Item	Description
▢	Design Challenge Question	• Provides overarching question to frame the purpose of the project.
▢	Needs and Constraints	• List the needs and constraints you identified. Your presentation should show how your design meets and exceeds these needs.
▢	Research Findings	• Explain the results of your research into possible solutions
▢	Prototyping	• Describe your prototyping process, including methods you used • Include photos, illustrations, and designs of your prototypes

▢	Recommendations	• Share your recommendations based on your research, prototyping, and test results
▢	Lessons Learned	• List and discuss lessons learned from your prototyping and testing
▢	Next Steps	• List next steps for making improvements and recommendations
▢	Summary	• Conclusion of how your prototype solution meets the design challenge

11
days until
STEM III Final Presentation Week

STEM III Evaluations: Innovation

Application of the Creative Thinking Rubric for STEM III Evaluations

STEM III utilizes the Creative Thinking Rubric for assessment of innovation. This rubric defines creative thinking as "both the capacity to combine or synthesize existing ideas, images, or expertise in original ways and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking."

To aid in the application of the rubric for innovation, students should note key words that distinguish levels of performance. These words are highlighted in the following tables for the innovation rubric areas: "Acquiring Competencies", "Taking Risks", and "Solving Problems".

Level of Performance	Description of Behavior for the "Acquiring Competencies" Rubric Area	Key Word Comparison
Capstone (4) or Advanced	Reflect: Evaluates creative process and product using domain-appropriate criteria.	• Reflect • Evaluate creative process • Domain-appropriate criteria
Milestone (3) or Proficient	Create: Creates an entirely new object, solution or idea that is appropriate to the domain.	• Create • Entirely new object, solution or idea
Milestone (2) or Below Basic	Adapt: Successfully	• Adapt • Adapts an

	adapts an appropriate exemplar to his/her own specifications.	appropriate exemplar
Benchmark (1) or Below Basic	Model: Successfully reproduces an appropriate exemplar.	• Model • Reproduces an appropriate exemplar

Level of Performance	Description of Behavior for the "Taking Risks" Rubric Area	Key Word Comparison
Capstone (4) or Advanced	Actively seeks out and follows through on untested and potentially risky directions or approaches to the assignment in the final product.	• Actively seeks out • Follows through • Untested and potentially risky • In the final product
Milestone (3) or Proficient	Incorporates new directions or approaches to the assignment in the final product.	• New directions • New Approaches • In the final product
Milestone (2) or Below Basic	Considers new directions or approaches without going beyond the guidelines of the assignments.	• Considers new directions • Considers new approaches • Without going beyond the guidelines
Benchmark (1) or Below Basic	Stays strictly within the guidelines of the assignment.	• Stays strictly within the guidelines

	Description of	

Level of Performance	Behavior for the "Solving Problems" Rubric Area	Key Word Comparison
Capstone (4) or Advanced	Not only develops a logical, consistent plan to solve problem, but recognizes consequences of solution and can articulate reason for choosing solution.	• Not only develops logical, consistent plan • Recognize consequences • Articulate reasons for choosing solution
Milestone (3) or Proficient	Having selected from among alternatives, develops a logical consistent plan to solve the problem.	• Selected from among alternatives • Logical, consistent plan
Milestone (2) or Below Basic	Considers and rejects less acceptable approaches to solving problem.	• Considers • Rejects less acceptable approaches
Benchmark (1) or Below Basic	Only a single approach is considered and is used to solve the problem.	• Single approach

Comments

You do not have permission to add comments.

You do not have permission to add comments.