Project Based Learning Submission

Time Line	3 Weeks	
Name: Terrence M. Hackett	Teacher Mentor	
PROJECT II: Fall 2019	Designing an Artificial Martian Base/Habitat	***Peer Feedback***
Entry Event https://www.youtube.com/watch?v=BxtK_K5lK-c **Martian Habitat 2019.docx** **https://www.youtube.com/watch?v=TkAqfqmcnGA**	Grade Level: 10-12 Curriculum Focus: Earth Science Engineering ES.1 The student will plan and conduct investigations in which a) technologies, including computers, probeware, and geospatial technologies, are used to collect, analyze, and report data and to demonstrate concepts and simulate experimental conditions; b) scales, diagrams, charts, graphs, tables, imagery, models, and profiles are constructed and interpreted; ES.3 c) characteristics of the sun, planets and their moons, comets, meteors, and asteroids; and c) the history and contributions of space exploration ENG. 9.2 The student will produce, analyze, and evaluate auditory, visual, and written media \ messages. a) Analyze and interpret special effects used in media messages including television, film, and Internet. b) Determine the purpose of the media message and its effect on the audience.	
Driving Question	Your group of 4 Scientists/Engineers are tasked with designing an initial, artificial Base of Operations (Habitat/Environment) on the planet Mars, in preparation for near future colonization of the planet by Humans.	
Need to Know (student generated ideas) Consider assisting students with these questions, should they not be addressed in the Question Generating Exercise.	Amount of Solar Radiation exposure on the Planet Temperature Cycles on the Planet Internal Gases/Pressures needed to pressurize and maintain the environment In-situ building materials	

	Size of the Base/Habitat(s) Food/Water/Waste Management	
Inquiry Where are they going to find information? Students will request Graphics to be used in PowerPoint Presentation	Internet Research: Instructor will assist: https://www.nasa.gov/feature/students-design-space-habitat-concepts-for-mars http://www.makexyz.com/3d-models-Mars-habitat https://mars.jpl.nasa.gov/all-about-mars/facts/ https://mars.jpl.nasa.gov/#red_planet/1 Media Center: Media specialists will assist in how to find useful media. School Text Books Magazines	
Profile of a Graduate/21st Century Skills	Creative Thinking, Collaboration, Communication, Critical Thinking	
Voice and Choice	Each student will choose a specific component of the Habitat Design (Overall Construction Design; Food/ Water/Waste Management; Appropriate Atmosphere/Pressure/Temperature; Radiation Protection etc.) and concentrate his/her focus on that particular aspect. Students will use 3-D Printer Software to assist in their design construction, and print 3-D Model of their component. Students bring their ideas/designs together, and compile into a Final Habitat Design. Students will work together a put together a PowerPoint Presentation explaining Final Design Construction	
Opportunities for revision	Peer Review/Critique Teacher Review/Critique	
Public Audience	Class, School Faculty, Invited Guest, Parents	
Formative Assessment	Project Organization/Design Design Rubric	
Summative Assessment	Rubric Group Presentation 3-D Model	

Rubric Link	See attached	

- **Presentation Rubric** **Mars Habitat**

Criteria →	Focus & Specificity	Support	Thoughtfulness	Use of Language
Excellent 3 points	Students were highly engaged in research activity; they prepared a comprehensive and thoughtful opening statement; they asked clear, challenging questions	Students gave substantial information on design rationale and answers based on **several** facts from their research.	Students' designs are articulate and show a high level of thought and expression	Students' Design writing is well organized, unified and error free
Good 2 points	Students participated in research activity; they created a somewhat comprehensive opening statements; they asked somewhat clear, challenging questions;	Students gave some information on design rationale and answers based on **some** facts from their research.	Students' designs show some thought and expression	Students' Design writing is somewhat organized and unified, with some errors
Fails to Meet Expectations 0 - 5 points	Students participated minimally in research activity; they created a simplistic opening statement; their questions were shallow or not well thought out	Students' information on design rationale was simple not supported, and without basis in fact or research.	Students' designs show little to no thought or expression	Students' Design writing is not organized or unified; errors impair understanding