Mr. Gregg

STEM 7 Curriculum Map

Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
1 Lesson	Engineering Think like a Scientist - Intro to Engineering	Engineering Principles	Think like a scientist: Asking questions like a scientist. Learning how to narrow your questioning and broaden your thinking. Taking steps to research the new concept or question that was posed.	What is an engineer? What different types of engineers are there? How do engineers process through their questions or tasks? What are successful examples of tasks that took numerous tries?	Research Ideat Evaluate Analyze Engineering Engineer
Wood Working Unit					
4 Lessons	Wood Working and Tools	Basic WoodWorking, Machinery and hand tools	Students will be educated on the proper safety for each of the machinery and hand tools available. Students will demonstrate they can safely use each of the tools prior to using them. Students will be able to select from 3 projects to complete independently. Students will be asked to use the various tools to create a project that meets the rubric expectations.	What is the proper way to use a Scroll Saw, Circular Sander, Belt Sander, Band Saw, Drill Press, Table Saw? How do you apply stain to wood? How do you glue and clamp wood together? How do you create a design template and apply it to the wood? What are your engineering steps for this project?	Scroll Saw Band Saw Circular Sander Belt Sander Saw Blade Sanding Stain Engineering Process Relief Cut Level Flush Cut Square

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Rocketry

Lessons	Topics	Math/ Science Skills	Objectives	Essential Questions	Vocabulary
2 Lessons	Space Exploration Woman in Space	Space Exploration and astronomy	Students will use the week of October 4-8th to celebrate the launch of Sputnik and watch a documentary on Nichelle Nickles, who was an impactful part of the NASA recruitment and change in NASA policy towards women and minorities. Introduce recent applicable literature for students to use as resources and learning tools to explore more about the topics in the video.	What would it have been like to hear Martin Luther King tell you to not quit and keep going? What was inspiring about the film? What do you think the purpose of showing the film was? What inspired you? How would you have prepared to recruit for the space program if you were given four months? What are some famous rocket launches in world/nations history? How/where does the history of rocketry begin and progress?	NASA Space Station Civil Rights Women's rights Sputnik Apollo Nichelle Nickles Recruit Inspiration Astronaut Space Program Launch
2 Lessons	Paper Rockets	Angles Distance, Rate and Time (D=RxT) Graphing Decimals Quadratics- *(Enriched)* Engineering Force and Motion Algebra	To understand the anatomy of a rocket To create their own personal rockets and test them out with PVC air compressed launcher To understand features of flight and how it works	How are Newton's 3 laws of motion aligned to rocketry? What are the different parts of the rocket called What are essential components to make a rocket fly properly and take off. What safety features do we	Reactive energy Transfer of energy Force Pressure Thrust Propellant Nose Cone Nossel Fins Fuel Lodge Ascent/ Descent

		Geometry		have to keep in mind when flying rockets. What factors can affect flight?	Newton's Laws Parachute (Lug, Chord) Ejection Charge Delay Charge
2 Lessons	Water Rockets		To understand the transfer of energy built up by water pressure to reactive energy. (Newton's 3rd Law)	What are Newton's laws and how are they applied to rocketry and flight? How does a fuel cell work? What are the parts of the model rocket and how to they work together for liftoff and landing?	
2 lessons	Fuel Cell Pitsco Model Rockets		Create their model fuel rocket Understand the operation and engineering of a fuel cell in a model rocket. Students will be able to study the anatomy and creation of various rockets and the development and progression of rocketry history.		

Locomotion (Cars)

Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
5 Lessons	Mouse trap cars	Engineering (mechanical) Distance, rate and time Fractions/Decimals Laws of Motion Principles of Physics	Students will be able to go through the engineering process and steps to create their own personal Mouse Trap Dragster. They will evaluate and analyze their car during the and after the creation process to determine ways to better their vehicle through trial runs. Students will compete in a series of competitions where they will need to calculate and record their own distances,	What is your engineering process through this project? What obstacles caused your car to not move, move little or move slow? What factors were successful? What made you come to those conclusions? What does it mean to evaluate and modify your project?	Energy Transfer Kinetic Energy Driving Axle Compressed Energy Stored Energy Friction Recoil Tension Engineering Process

			rates and times using the **Distance = Rate x Time formula.**		
4 Lessons	CO2 Cars	Engineering Principles and Creation Velocity Distance, Rate and Time Mass	Students get to build and create their own air cars (similar to CO2 cars) where they will get the chance to compete in a series of competitions. Tie in the Wood Working unit to a new project aligned with locomotion. Reapply the understandings of what causes drag, friction, low aerodynamics,	How does mass affect velocity? What factors of aerodynamics did you incorporate into your design? What is the relationship between mass and velocity? What design types seemed to have the greatest success? Difficulties?	Force Impact Velocity Mass Trajectory Aerodynamics Friction Engineering Process Evaluate Assess

Imagineering In a Box Project

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Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
15 Lessons	Disney Imagineering in a Box	Engineering Principles and Creation Design Research Writing	Students will be exploring the overarching design and creation process that goes into the development of a theme park such as Disney World or Orlando Studios. Students will progressively ideat, design, create, engineer and build their own theme park. From their minds to paper to actual construction, students will make a story or theme park of their dreams come to life in a scale model.	What is theme? How is a theme park different from an amusement park? How does each detail connect to the story? How do story and theme connect to make a theme park? How did the engineers at Disney create their worlds? What factors did they consider along the way to make it as real as possible?	Imagineering Scale Drawing Color Scheme Theme Mood Board StoryBoard Capacity Ride System Prototype Digital Armatures Graphic Design Google Draw