

Southern Cayuga Central School

STEM 8 Curriculum Map 2023/2024

In addition to the lessons listed, students will participate in team STEM Challenges every Friday! Topics are a baseline of expected curriculum. Student interest and engagement will determine if a more in depth focus on any topic will occur. The Enterprise America Curriculum may also be woven into our curriculum over a three month period.

Title or Topics w/ NYS Standards	Essential Questions & Vocabulary	Content Skills (Activities to cover Essential Questions)	Major Assessments (Tests, Project, etc.)	Time Frame
Class Expectations and Understanding of Teamwork	What are qualities of effective teamwork?	Cup Stacking Challenge	Completing 5+ of the cup stacking challenges using only 3 strings attached to a rubber band	1 class
Escape the Room Teambuilding & Problem Solving	Can you work with your team to be first to find solutions? Vocab: determination, specify, exhibit	Students will work in groups of four to complete the tasks required.	Class discussion of solutions, what worked, what should be changed	1 class
<u>Module 8.1</u> MS-ESS2-1 MS-ESS1-2 MS-ESS1-3 MS-PS2-4 MS-PS4-1 MS-PS4-2 MS-PS4-3 MS-Ls4-6 MS-ETS1-1	<u>"How Does the Universe Affect Me?"</u> Absorption Accretion Amplitude Angle Astronomy Axis Consensus Model Constellation Cosmologist Cosmology Electromagnetic	<ul style="list-style-type: none"> ● How Did the Universe Form? ● Where is the Earth in the Vast Universe? ● How Do We See Objects? ● Can We Develop a Model of How We See Objects? ● How Does the Eye Sense Light? ● How Does Light Create Shadows? ● What Happens When Light Bounces Off an Object? ● Why Can I See Through Some Objects? ● What Else Can Light Do? 	<ul style="list-style-type: none"> ● Handouts ● Group Activities and Projects ● Lab Experiments ● Readings ● Activities ● Quiz ● Test 	Sept.11 – Oct. 27 ~7 Weeks

	<p> Spectrum Elliptical Energy Equatorial plane Frequency Galaxy Gravity/Gravitational Force Infrared Light path Lunar Eclipse Measurement Milky Way Model Moon Phases New Moon Nonvisible Opaque Orbit Partial Eclipse Penumbra Planet Ray Reflection Revolve Satellite Scattering Seasons Sensor Shadow Solar Eclipse Solar System Spectrum Star Telescope Tilt Total Eclipse Translucent Transmit </p>	<ul style="list-style-type: none"> • What is Light's Role in the Earth-Sun-Moon System? • Could There Be Light I Can't See? • How Does Ultraviolet Light Affect Me? • Is a Digital or Analog Signal Better? 		
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	Transparent Ultraviolet Umbra Universe Visible Light Wane Wave model Wax			
Reading, Writing, and Following Instructions. NYS Standard 4.	Why is it important to be able to communicate ideas, rules, and instructions? Vocab: coherent/incoherent, complexity, correlation, devise, specify	Write It—Do It activity with Legos. Handout from Science Olympiad. Team building.	Group completion of the activity. Journal entry.	1 class
Applied Digital Skills	What digital skills are needed for the jobs of today and tomorrow	Applied Digital Skills Online Curriculum	Completion of assigned Applied Digital Skills lessons	15-20 Assignments
Paper Tower Structure: Problem solving, critical thinking, and goal setting.	How high can a paper tower structure be? Vocab: approach, conceivably, perception, validity	Paper tower activity.	Grade based on percentage of highest tower built.	1 class
Introduction to GPS and GIS. NYS standards 2 and 7.	How can we locate objects using technology? Vocab: acquire, accurately, employ, specify, virtual	Orienteering using compasses. Intro to latitude and longitude grid systems. Intro to map making and telemetry.	Participating in a geocaching activity, using GPS and given clues to located a hidden item.	10 classes

Escape the Room Math Review	How quickly can your team use your math knowledge to complete the given tasks? Vocab: determination, specify, exhibit	Work in a team of four and use math background knowledge to solve a variety of required tasks. Problem solving and team building.	Completion of required solution cards/sheets. Class discussion of solutions and shortcomings.	1 class
Vibrobots Standards 5 & 6	How quickly can the Vibrobot complete the course? What is an Engineering Notebook? Why use an Engineering Notebook? Vocab: approach, analytical, complexity, dynamic, specify, label, design	Design and build a 'Vibrobot' using the motor from an electric toothbrush and various materials. Introduction of an Engineering Notebook. Video examples of Vibrobot Competition and explanations of Engineering Notebooks.	Creation of an Engineering Notebook to document the entire process from brainstorming to final design, supplies and average speed. Rubric for participation and Engineering Notebook.	1-2 classes
LED Card	What is a circuit?	Research circuits and design a greeting card that illuminates when a circuit of copper tape is closed	Functioning lights on a greeting card.	1 class
Coding NY Standard 2	What is coding?	Complete CS First coding course	Utilize code.org to complete a minimum of 20 lessons	10-12 classes
Begin Coding. NYS standard 2.	How can you use drag and drop coding to create a game?	Code Monkey SCRATCH.MIT.EDU	Create a game that has 2 'sprites' that when they interact, a new function occurs	30 classes

VEX IQ Code the Vex EDR robots . NYS standard 2.	What are some of the basic coding commands? Vocab: coding, virtual, acquire, analyze, exhibit, input, design, sequence of events	Code a virtual robot to perform simple commands.	Completing the simple coding program.	10 classes
VEX IQ Code the Vex EDR robots . NYS standard 2.	How can coding help us use robots for simple tasks?	Have the robot perform a simple task and then modify it to perform more efficiently.	Successful completion of the assignment	8-10 classes

	Vocab: coding, virtual, acquire, analyze, exhibit, input, design, sequence of events			
Flight Standards 2 & 7	What are the forces involved in flight?	Paper Airplane Challenge	Research and design of paper airplane models that can fly the farthest/most accurate	2-3 classes
Drone Technology NYS standards 2, 5 and 7.	How is GPS used with today's technology? coding, virtual, acquire, analyze, exhibit, input, design, sequence of events	Guest speaker from ag sector and field trip to local farms utilizing technology (Precision Agriculture)	PowerPoint or poster presentations on GPS.	4-6 classes
Drone Technology Standards 4, 2 and 1	How do you control a drone's movement? What are Careers utilizing drones? Vocab: Drones, innovative technology, process,	Watch videos to learn about drone technology. Learn safety/regulations of operating drones. Operate a drone to manipulate it through obstacles and to follow sets of Learn how to control a drone.	Complete set of commands with precision and speed.	10-12 classes

	analyze, exhibit, demonstrate, proficient, Flight plan,			
Environmental Engineering Standards 1, 5 and 7	How can a 'project' be built with limited resources (based on cost)? Vocab: approach, conceivably, perception, validity, finance, constraints, analyze, redesign, availability, sustainable	Students will work in teams to complete a design challenge working with a set budget for materials.	Submit a final sketch with budget details.	3 classes