

Standards	STEM Unit 1	STEM Unit 2	STEM Unit 3	STEM Unit 4	STEM Unit 5	STEM Unit 6	U7	Tech Unit 1	Tech Unit 2	Tech Unit 3	Tech Unit 4	
23	5	3	3	5	4	2	4	24	4	6	6	4

Grade 7	Virtual Grid Map, Distance Sensor and Transfer Grid Map and Freeze Tag	Test Bed- Learn the Different Sensors	(Disc Maze) Vex Virtual Wall Maze and Then Real Maze using Sensors and Clawbot, Vex Robotics Pro/Cons Design Solution Negative Impact People Getting Hurt in workplace?	Vex Line Detect, Real Work in Factory Picking up Objects	Cube Pusher	Treasure Hunt (keep arm on) Optical- optical, cubes robot checks each cube, identify, simple claw or regular claw..	misc	Animation Create Climate Change Prevention	Spreadsheets, Forms and Technology Topic - Positive, Negative Effects	Internet Protocols with micro:bit, Packet Race, Internet/Network Safety and Security	Insurance Project
8.1.8.CS.1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.1.8.CS.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1.8.CS.3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1.8.CS.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.1.8.NI.1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.1.8.NI.2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.1.8.NI.3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.1.8.NI.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.1.8.IC.1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1.8.IC.2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1.8.DA.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1.8.DA.2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.1.8.DA.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8.1.8.DA.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

AI and Machine Learning

- users interact early computers, household app
- design system pcfecder, robotics sensors/timer robotics
- tradeoffs systems; screen size vs. battery performance
- tshoot resolve problems, hardware connection problems
- model packet protocol; packet race puzzle. image
- protocols data identify error
- network security - build fortress information
- security response malware events; timeline, mock news
- tradeoffs: tech everyday, careers-sphomes school
- issues bias/access: hearing impaired video games
- organize data purpose proejct, graphs, dbase, sprcad, etc.
- explain bits/bytes and binary lesson
- file conversion appropriate tool, explor
- tranform data remove errors: feedback

- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices. Analyze online reviews, compare/contrast early computers with touch screens, brainstorm how to improve household, redesigns mobile app
- 8.1.8.CS.2: Design a system that combines hardware and software components to process data. Design home security system motion sensor, automatic pet feeder robotics sensors/timer software, conditions
- 8.1.8.CS.3: Justify design decisions and explain potential system trade-offs. Screen size, battery performance, cost, tools startups.
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems. Divide/conquer approach, develop flowchart, solve problems for younger students, hardware connection probs.
- 8.1.8.NI.1: Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination. Landline/cell versus: ethernet wireless. Packet race send across the classroom and reassembled at the end., how data is broken down into parts., large image like broken puzzle. Scrambled messages, rearrange.Landline, cell, ethernet, wireless- discuss different, show short video.
- 8.1.8.NI.2: Model the role of protocols in transmitting data across networks and the Internet and how they enable secure and errorless communication. Telephone game, handshake routine list common protocols., pre-arranged cards change identify error..A short written assignment on a protocol of their choice and its role in data transmission
- 8.1.8.NI.3: Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems. Build fortress cardboard, etc. label parts firewalls, p words, sware/hware visuals help. Importance: group pres
- 8.1.8.NI.4: Explain how new security measures have been created in response to key malware events. Mock news report on fictional malware. Malware events and response to timeline.
- 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect an individual's everyday activities and career options- different careers. Tech gadgets smartphones pros/cons routine; classroom debate
- 8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies. Facial recognition, color contrast, captioning for hearing impaired, popular video game biases
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. Spreadsheets project, graphs, database change,
- 8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed. Bits/bytes and ASCII compare. Binary code Audio/video to binary.
- 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format. File conversion activity, recognition, explore.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis. Spot errors, data cleaning.



8.1.8.DA.5

8.1.8.DA.6

8.1.8.AP.1

8.1.8.AP.2

8.1.8.AP.3

8.1.8.AP.4

8.1.8.AP.5

8.1.8.AP.6

8.1.8.AP.7

8.1.8.AP.8

8.1.8.AP.9

8.2.8.ED.1

8.2.8.ED.2

8.2.8.ED.3

8.2.8.ED.4

8.2.8.ED.5

8.2.8.ED.6

8.2.8.ED.7

8.2.8.ITh.1

- test, refine models with Vex VR compare models
- Analyze climate change simple refine models
- Algorithms flowchart, pseudocode robotics
- Variable MyBlocks, Celsius to Fahrenheit
- Iterative nested loops robotics
- Decompose probs, sub, system use nested loops robotics
- Create parameters reuse difficult situations; rect robotics
- Refine with feedback users; survey tool, robotics challenges
- Design existing code; modify add on to existing program
- test/refine programs, AI2 app calk robot tasks
- Doc programs test, debug; Engineering notebook, manual
- eval function, value, look from user: cr
- Steps solve in design process; robot ho
- Proposal w/ model: Identify leaves, skc
- Test options repair system; robotics fix
- Explain need optimization, paper airplane
- Tradeoffs impact product design: battery life/size
- Design product address problem: eco friendly water bottle
- Explain tech product econ, pol, soc, cult: Fix toaster/answers

- 8.1.8.DA.5: Test, analyze, and refine computational models. Feedback loops, sim software (Vex VR), compare models.
- 8.1.8.DA.6: Analyze climate change computational models and propose refinements. Suggest changes, simplified c change models.
- 8.1.8.AP.1: Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode. Robotics
- 8.1.8.AP.2: Create clearly named variables that represent different data types and perform operations on their values. Variables Myblocks, Program Celsius to Fahrenheit.
- 8.1.8.AP.3: Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. Use nested loops robotics
- 8.1.8.AP.4: Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. Breakdown problems recipe, password checking.
- 8.1.8.AP.5: Create procedures with parameters to organize code and make it easier to reuse. Rectangle robot, Sphero.
- 8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users. Survey tool and get changes, challenges robotics, etc.
- 8.1.8.AP.7: Design programs, incorporating existing code, media, and libraries, and give attribution. Add on existing programs.
- 8.1.8.AP.8: Systematically test and refine programs using a range of test cases and users. Test calc app AI2, Robot tasks
- 8.1.8.AP.9: Document programs in order to make them easier to follow. test, and debug- Engineering notebook , manual, comments
- 8.2.8.ED.1: Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer. Function car, robot, phone, etc. Scice car,robot
- 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem. Where to find errors? Robot household chores list steps for prototype, potential errors.
- 8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch). App Inventor, Robot Sketch. Identify leaves
- 8.2.8.ED.4: Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team. Robotics Pairs fix it, devise process to fix, work to find fix
- 8.2.8.ED.5: Explain the need for optimization in a design process. Test paper airplane flight, how to make it go longer.
- 8.2.8.ED.6: Analyze how trade-offs can impact the design of a product: battery life/size.
- 8.2.8.ED.7: Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches). Design eco-friendly water bottles, costs, sketches.
- 8.2.8.ITH.1: Explain how the development and use of technology influences economic, political, social, and cultural issues. Fix toaster and find solutions.



Compare Technology Over Time:  
Cars



impact sustainable product over time



Tech designed neg. consequences of other technologies



compare tech good for one place not another



Examine malfunctioning tool propose :



Repurpose for robot existing tech prod  
examine system redesign: bicycle,  
robot for other purpose



Product made changed:  
airplane/drone, work/work w/ robots



Upcycle product: plastic for planters



Change resources: replace toy with solar panel



Design negative impact, give solution: envr. friendly packing



Compare environmental effects (solar vs. wind)



expain ethical considerations: facial recognition, robots jobs



Look at ethical/unethical practices  
product design: unfair labor, resources (Fair Wages, Fair Labor, Over-



consumption make products not sure environmental impact, make products with short lifespan, job displacement, monitor workers. Ethical fair labor: skills for new workers, high-skilled roles, fair pay, sustainability, resources optimize (drones), biodegradable.



Volunteer



Sustainable Products: Gov't, consumer, business importance.





- 8.2.8.I TH.2: Compare how technologies have influenced society over time. Old CDs what to use for.
- 8.2.8.I TH.3: Evaluate the impact of sustainability on the development of a designed product or system.
- 8.2.8.I TH.4: Identify technologies that have been designed to reduce the negative consequences of other technologies and explain the change in impact.
- 8.2.8.I TH.5: Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.
- 8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.
- 8.2.8.NT.2: Analyze an existing technological product that has been repurposed for a different function. Repurpose for robot.
- 8.2.8.NT.3: Examine a system, consider how each part relates to other parts, and redesign it for another purpose. Redesign a bicycle, robot, serve another purpose.
- 8.2.8.NT.4: Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product. Airplane to Drone, Landline to Smartphone, Workers Auto by themselves, workers with automation robots.
- 8.2.8.ETW.1: Illustrate how a product is upcycled into a new product and analyze the short- and long-term benefits and costs. Plastic bottles can be used as planters. Benefits and costs, time.
- 8.2.8.ETW.2: Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital). Replace toy with solar panel, changes of material and function.
- 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. Alternative packaging.
- 8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best. Solar versus Wind power, costs, effectiveness, impacts, etc.
- 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. Facial recognition privacy concerns
- 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development. (labor unfair, resource minerals)
- 9.1.8.CR.1: Compare various ways to give back through strengths, passions, goals, and other personal factors. Volunteer.
- 9.1.8.CR.3: Relate the importance of consumer, business, and government responsibility to the economy and personal finance. Choose sustainable products.



- 9.1.8.CDM.2
- 9.1.8.CP.1
- 9.1.8.CP.2
- 9.1.8.EG.6
- 9.1.8.FL.1
- 9.1.8.FL.4
- 9.1.8.FP.1
- 9.1.8.FP.2
- 9.1.8.FP.3
- 9.1.8.FP.5
- 9.1.8.FP.6
- 9.1.8.PB.4
- 9.1.8.RM.1
- 9.1.8.RM.2
- 9.1.8.RM.4
- 9.4.8.CI.2
- 9.4.8.DC.3
- 9.4.8.DC.8

9.1.8.CDM.2: Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages, lines of credit) and compare and calculate the interest rates associated with each

9.1.8.CP.1: Compare prices for the same goods or services. Different prices? Why?

9.1.8.CP.2: Analyze how spending habits affect one's ability to save. Going to Starbucks every day? Reduce!

9.1.8.EG.6: Explain the economic principle of the circular flow of money in different situations regarding buying products or services from a local or national business and buying imported or domestic goods. Import vs. Export of products.

9.1.8.FI.1: Identify the factors to consider when selecting various financial service providers.

9.1.8.FI.4: Analyze the interest rates and fees associated with financial products.

9.1.8.FP.1: Describe the impact of personal values on various financial scenarios. Clara pays more for sustainable, local products.

9.1.8.FP.2: Evaluate the role of emotions, attitudes, and behavior (rational and irrational) in making financial decisions. Buying expensive games and advertisements led to buying something I didn't need.

9.1.8.FP.3: Explain how self-regulation is important to managing money (e.g., delayed gratification, impulse buying, peer pressure, etc.). Wait for sale, don't take money out of investment.

9.1.8.FP.5: Determine how spending, investing, and using credit wisely contributes to financial well-being. Invest stocks over years.

9.1.8.FP.6: Compare and contrast advertising messages to understand what they are trying to accomplish. Cereal: health vs. fun. Car: safety versus speed.

9.1.8.PB.4: Construct a simple personal savings and spending plan based on various sources of income and different stages of life (e.g., teenager, young adult, family). Budgeted for items to buy.

9.1.8.RM.1: Determine criteria for deciding the amount of insurance protection needed. Flood: should get? Increase home insurance? Valuable items at home.

9.1.8.RM.2: Analyze the need for and value of different types of insurance and the impact of deductibles in protecting assets against loss.

9.1.8.RM.4: Explain the purpose of insurance products and the reasons for property product and liability insurance protection.

9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3). Xbox as a charging station.

9.4.8.DC.3: Describe tradeoffs between allowing information to be public (e.g., within online games) versus keeping information private and secure.

9.4.8.DC.8: Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities). Implement sensors to monitor air quality and address pollution.



9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. Screen time/sleep. Sales versus advertising.

9.4.8.IML.9: Distinguish between ethical and unethical uses of information and media (e.g., 1.5.8.CR3b, 8.2.8.EC.2). Copyright

9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. Analyze information.

9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. \*

9.2.8.CAP.11: Analyze potential career opportunities by considering different types of resources, including occupation databases, and state and national labor market statistics.

9.2.8.CAP.8: Compare education and training requirements, income potential, and primary duties of at least two jobs of interest. \*