Intro to Robotics and Programming
HSTCH 230

UNIT NAME	LESSONS	LEARNING TARGETS/ OBJECTIVES	Resources (Suggested Activities)	ASSESSMENT	CROSS CURRICULUM CONNECTIONS
Introduction: Free Building	Unit Plan	The following VEX STEM Lab helps to provide students with a fun and relevant way to investigate the kit of VEX V5. Students will complete a variety of different tasks to explore their creativity, learn the parts of their kit and engineer different robot designs.	Scavenger Hunt Lesson Get in Shape Lesson How Big Are Your Teeth Lesson Hang Out Lesson	Unit assessment will be done through the results competition, debrief conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric Other Grading Rubics	Engineering Math Science
Mechanical Advantage	Unit Plan	Students will build the Gearbox and also explore mechanical advantage of gear ratios.	Mechanical Advantage Teacher Outline	Unit assessment will be done through the results competition, debrief	Engineering Math Science

			Gearbox Build Instructions Torque or Speed	conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric Other Grading Rubics	
Robo Rally	Unit Plan	For this VEX Stem Lab, students are asked to use proportional reasoning and scale to design a racecourse for the Speedbot. Students will begin by creating a racecourse by planning with scaled drawings. Then, analyze relationships between scaled measurements. Students will finish the unit by practicing converting units and proportional reasoning.	Robo Rally Teacher Outline Robo Rally Pacing Guide Robo Rally Build Instructions Converting Units Lesson Robo Rally Challenge	Unit assessment will be done through the results competition, debrief conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric Other Grading Rubics	Engineering Math Science
Robo Soccer	Unit Plan	The following VEX STEM Lab will introduce students to the iterative	Speedbot Build Instructions	Unit assessment will be done through	Engineering Math

		process by having them design and test attachments to their robots for the purpose of playing the game of Robosoccer. After contextualizing robot sports as opportunities for broadening applications of robot technologies, students are asked to remotely control their robots to dribble a soccer ball around cones and design an attachment to more effectively do so. Students document their design process and receive constructive feedback from peers to model more professional collaborations. They then build, test, and further refine their attachments for later use during the challenge of playing a Robosoccer game	Student Centered Model Cooperative Learning Model Teacher Direct Instruction Student Centered Lesson RoboSoccer Rules	the results competition, debrief conversation and engineering notebook Build Rubric Engineering Notebook Individual Reflection Rubric Collaboration Rubric	Science Engineering Design
Medbot	Unit Plan	The following VEX STEM Lab provides an engaging way to introduce students to behavior-based programming. Students analyze commands to recognize that everything in a project must be broken down into tiny behaviors that a robot can understand and perform directly. Through a series of exercises, students will learn how to program a robot to drive forward or in reverse, turn right or left, and wait. In the Automed Challenge, students will create a project that	Medbot Unit Pacing Guide Speedbot Build Instructions Behavior Based Programming Block Programming Forward and Reverse	Unit assessment will be done through the results competition, debrief conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric	Engineering Math Science Coding

		will make deliveries on a "hospital floor."	Block Programming Left and Right Prepare for Automated Challenge Design and Develop Your Project Automated Challenge	Other Grading Rubics	
Momentum Alley	Unit Plan	The following VEX STEM Lab helps to provide students with a fun and relevant way of learning about momentum and energy transfer. In Momentum Alley, students will demonstrate an understanding of programming their robot forward and in reverse in the Play section of the lab. They will then use their programming skills and their introduction to momentum and energy transfer to work as a team to design a project that will earn them as many points as possible in a roll. It's a traditional game of bowling with a robotic twist!	Momentum Alley Unit Pacing Guide Speedbot Build Instructions Block Programming Forward and Reverse Exploring Velocity	Unit assessment will be done through the results competition, debrief conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric Other Grading Rubics	Engineering Math Science
It’s a Draw	Umit Plan	The following VEX STEM Lab helps to provide that bridge between subjects. In “It’s a Draw”, students	Unit Plan Link Unit Preview	Unit assessment will be done through the results	Engineering Math Science

		will investigate how technology impacts the field of art and explore how robotics can be used as a tool in new ways of thinking, seeing, and creating.	Teacher Notes Guide STEM Lab Guide Clawbot Build Instructions Drawing with Your Robot Preparing for It's a Draw Challenge It's a Draw Challenge Unit Review and Know Questions	competition, debrief conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric Other Grading Rubics	Art
Speedy Delivery	Unit Plan	The following VEX STEM Lab provides an engaging way to introduce students to behavior-based programming. Students analyze programming to recognize that every solution must be broken down into tiny behaviors that a robot can understand and perform directly. Through a series of exercises, students will review how	Unit Pacing Guide Unit Preview STEM Lab Guide Clawbot Build Instructions Programming Info	Same as above	Engineering Math Science Coding

		to program a robot to drive forward or in reverse and turn right or left. They will be introduced to programming the Claw attachment and utilize their knowledge to complete the "Package Dash Challenge." In the "Package Dash Challenge," students will create a project that will direct the robot to pick up packages and bring them to a shipping area as fast as possible.	Behavior Based Programming Programming the Robot Arm Programming the Claw Range of Motion Package Dash Challenge		
Loop, There It Is	Unit Plan	The following VEX STEM Lab will introduce your child to loops and ask them to complete several mini challenges to experiment with using loops within their projects. This information will be used later in the “Groove Machine Challenge,” where students will program robot movements to repeat, causing their robot to "dance."	Unit Pacing Guide Clawbot Build Instructions Programming Loops Block Based Programming Controllers and Loops Groove Machine Challenge	Unit assessment will be done through the results competition, debrief conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric Other Grading Rubics	Engineering Math Science Coding

To Do, Or Not To Do	Unit Plan	The following VEX STEM Lab will build upon previously learned programming concepts by introducing your child to conditional statements and how sensors can serve as the input deciding if the conditional is true. They will also explore how a conditional statement can be looped, repeating a decision or executing a behavior.	Unit Pacing Guide Clawbot Build Instructions Exploration Programming with Conditionals Programming Decision Making Adding to the Brains Screen The Controller as a User Interface The User Interface Challenge	Unit assessment will be done through the results competition, debrief conversation and engineering notebook Debrief Conversation Rubric Engineering Notebook Rubric Other Grading Rubics	Engineering Math Science Coding