Summary:

This Pacing Guide covers a 36-Week progression using both V5 STEM Labs and EXP STEM Lab Units.
- To learn more about the structure of V5 STEM Labs, view this article.
- To learn more about the structure of EXP STEM Lab Units, view this article.

STEM Labs are fun STEM engagements that align to educational standards. All STEM Labs contain activities that are structured around iterative, engineering design processes, real-world applications and opportunities for students to build teamwork and collaboration skills. STEM Labs provide students with hands-on, minds-on engagement that encourages students to design creative solutions and innovate through experimentation. STEM Labs are flexible enough to be used in any instructional setting (e.g. in-school, after-school, camps, or VEX robotics teams/clubs).

While working through this pacing guide, students will begin using the Speedbot and investigate the movement of the robot using the Drive Program on the Brain or by basic programming. Then, they will move into more complex coding scenarios using the Clawbot and finish their journey with advanced engineering using both the Clawbot and other unique builds.

For information on how to adapt EXP STEM Lab Units to use with V5 Kits, see this article

Weeks	STEM Lab	Level	Description	Build	Coding?	Key Concepts
Week 1	Robo Rally (V5)	Beginner	Students are asked to use proportional reasoning and scale to design a racetrack for the Speedbot.	BaseBot	No (run Drive Program)	Mathematical Reasoning
Weeks 2 and 3	Team Freeze Tag	Beginner	Students will drive the TrainingBot using the Controller, and add the Bumper Switch to their robot to compete in the Team Freeze Tag competition.	BaseBot	No (run Drive Program and use Example Projects)	Controller Sensors Programming
Weeks 4 and 5	Medbot (V5)	Beginner	Students are asked to program a robot to deliver medication to patients on a hospital floor that they create. Students will learn how to program the Speedbot to drive forward, in reverse, turn left, and turn right.	BaseBot	Yes	Programming
Week 6	Momentum Alley (V5)	Beginner	Students are asked to program a robot to knock down bowling pins (cans or water bottles) using momentum. They will explore how to program at different velocities.	BaseBot	Yes	Science: Velocity and Momentum
Week 7	It's a Draw! (V5)	Beginner	Students will explore the Clawbot and using it as an artistic tool in a drawing game.	Clawbot	No (run Drive Program)	Artistic Skills
Week 8	Vision Sensor (V5)	Beginner	Students will explore a program that processes how the Vision Sensor input data should affect the Clawbot's behavior. This information will later be analyzed in the “Vision Data Challenge,” where students will analyze how the sensing blocks in VEXcode use the data received from the VEX Vision Sensor to report values.	Clawbot	Yes	Engineering Design (using the Vision Sensor)
Week 9	Bucky Basketball (EXP)	Intermediate	Students will explore how to drive the CatapultBot to collect, shoot, and score Buckyballs into hoops in the Bucky Basketball competition.	CatapultBot	No	Engineering Design Controller
Weeks 10 and 11	Speedy Delivery (V5)	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes	Programming
Weeks 12 and 13	Loop, There It Is! (V5)	Intermediate	Students are asked 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."	Clawbot	Yes	Programming
Weeks 14 and 15	Castle Crasher (EXP)	Intermediate	Students will explore how to use the Optical and Distance sensors to seek, crash, and clear Buckyball ‘castles’ to score points in the Castle Crasher competition.	BaseBot	Yes	Engineering Sensors Algorithms
Weeks 16 and 17	To Do, or Not To Do (V5)	Intermediate	Students will explore 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.	Clawbot	Yes	Programming
Week 18	Clawbot with Controller (V5)	Intermediate	Students will explore programming the Controller to maneuver the Clawbot. They will analyze different ways to program the Controller by running different example projects such as Tank Drive and Clawbot Control.	Clawbot	Yes	Programming
Weeks 19 and 20	Robosoccer (V5)	Intermediate	Students are asked to build and utilize an extension to add to their Speedbot to dribble a ball and iterate on its design.	BaseBot	No (run Drive Program)	Engineering Design
Weeks 21 and 22	Robot Soccer (EXP)	Intermediate	Students will explore how to use the Controller to drive their Clawbot to grab, pass, and score the most points in a Robot Soccer competition.	Clawbot	No (run Drive Program)	Engineering Design Manipulators
Weeks 23 and 24	Up and Over (EXP)	Intermediate	Students will explore how to design a Clawbot to collect, pick up, and move Buckyballs from one side of the Field to the other, in the Up and Over competition.	Clawbot	No (May need VEXcode if students decide to use a motor group)	Engineering Design Arm Design Motor Groups
Weeks 25 and 26	Ring Leader (EXP)	Intermediate	Students will explore the difference between competing in a driver controlled and autonomous competition. They will use both autonomous and driver control in order to score Rings on different sized posts in the Ring Leader competition.	Clawbot	Yes	Driver Control Coding Autonomous Movement
Weeks 27 and 28	Treasure Hunt (EXP)	Intermediate	Students will build and code the Clawbot with the Optical Sensor to recognize and collect red Buckyballs to compete in the Treasure Hunt competition.	Clawbot	Yes	Sensors Programming
Week 29 and 30	Gravity Rush (V5)	Intermediate	Students will explore the Clawbot and the concept of the Center of Gravity. Students will drive the Clawbot over uneven surfaces with the its arm at different angles of it being raised and lowered.	Clawbot	No (run Drive Program)	Science: Center of Gravity

Week 31	Mechanical Advantage (V5)	Advanced	Students will explore how mechanical advantages and gear ratios can be applied in their builds, daily lives, and in robotics competitions.	Gear Box	No (Engineering)	Gear Ratios
Weeks 32 and 33	Design By Request (V5)	Advanced	Students will go through the engineering design process for an open-ended build activity.	Open Ended Design	No (Engineering)	Engineering Design
Weeks 33 and 34	Platform Placer (EXP)	Advanced	Students will explore using manipulators on the Clawbot, including lifts, to move Buckyballs and rings to platforms of different levels. They will cooperate with another team to create a strategy combining robot design and driver skills to compete in the Platform Placer Competition.	Clawbot	No, Run Drive Program. (VEXcode EXP optional)	Engineering Design Manipulators Lifts Driver Control Game Strategy
Weeks 35 and 36	Over Under (V5)	Intermediate	Get started with the 2023-2024 VRC Over Under game and the HeroBot, Striker! Students will build Striker, and use their HeroBot to begin to play Over Under. Students will be introduced to using the Over Under Game Manual, Driving Skills, and Autonomous Coding Skills, so that by the end of the Unit, they are prepared to compete in a Robot Skills Match.	Striker ***Requires the V5 Competition Starter Kit**	Yes	Competition

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The following 28-Week Pacing Guide is focused on engineering and coding. It will first expose students to building the Speedbot robot. They will use this robot to begin studying mathematical concepts, the engineering design process, and programming skills. Students will first design a scaled racetrack for their Speedbot and then proceed to build an extension to add to its design. Once the students have gained experience with the build, they will program the robot to drive forward, in reverse, turn left, and turn right all at different velocities.

Once the students have experience building and programming the Speedbot, then they will then learn to build the Clawbot. The Clawbot has a similar base to the Speedbot, but allows for more manipulation with the addition of the Arm and Claw. With the Clawbot, students will first explore how to build it and then use it to study artistic skills, the engineering design process, science skills, and programming skills.

Students will first use the Clawbot to draw and then proceed to program it to maneuver obstacles utilizing the Arm and Claw. Students will also explore the Vision Sensor and its capabilities while learn important programming concepts such as loops and conditionals. Students will also gain experience utilizing the Controller with the Drive Program.

Weeks	STEM Lab / Activity	Level	Description	Build	Programming?	Key Concepts
Week 1	Scavenger Hunt	Beginner	Students investigate the kit of VEX V5 parts to determine what is included in the kit and what pieces are called.	Free Build	No	VEX V5 Kit
	Get in Shape	Beginner	Students are asked to create different shapes using the VEX V5 parts.	Free Build	No	Engineering Design
	How Big Are Your Teeth	Beginner	Students investigate the pitch of gears and sprockets	Free Build	No	Engineering Design
Week 2	Robo Rally	Beginner	Students are asked to use proportional reasoning and scale to design a racetrack for the Speedbot.	Speedbot	No (run Drive Program)	Mathematical Reasoning
Week 3	Driver Configurations	Beginner	Students investigate the different ways to drive the robot with a V5 Controller.	Speedbot	No (run Drive Program)	Driving with the Controller
	Navigate the Maze with Driver Control	Beginner	Students are asked to create and navigate a maze using the Driver Control Program on the V5 Brain.	Speedbot	No (run Drive Program)	Driving with the Controller
Week 4	Robosoccer	Beginner	Students are asked to build and utilize an extension to add to their Speedbot to dribble a ball and iterate on its design.	Speedbot	No (run Drive Program)	Engineering Design
Week 5	Hang Out	Beginner	Students are asked to engineer a piece that will make the most of beams and plates in the kit to stick off of their desk the furthest distance	Free Build	No	Engineering Design
Week 6	Medbot	Beginner	Students are asked to program a robot to deliver medication to patients on a hospital floor that they create. Students will learn how to program the Speedbot to drive forward, in reverse, turn left, and turn right.	Speedbot	Yes (VEXcode V5)	Programming
Week 7	Square Dance	Beginner	Students are challenges to code their robot to drive in a square	Speedbot	Yes (VEXcode V5)	Programming
Week 8	Momentum Alley	Beginner	Students are asked to program a robot to knock down bowling pins (cans or water bottles) using momentum. They will explore how to program at different velocities.	Speedbot	Yes (VEXcode V5)	Science: Velocity and Momentum
Week 9	Team Freeze Tag	Beginner	Students will drive the TrainingBot using the Controller, and add the Bumper Switch to their robot to compete in the Team Freeze Tag competition.	TrainingBot	No (run Drive Program)	Driving with the Controller
Week 10	It's a Draw!	Beginner	Students will explore the VEX V5 Clawbot and using it as an artistic tool in a drawing game.	Clawbot	No (run Drive Program)	Artistic Skills
Week 11	The Claw	Beginner	Students investigate different types of claw designs and test them on their Clawbot.	Clawbot	No (run Drive Program)	Engineering Design
Week 12	Defend the Castle	Beginner	Students are asked to explore driving the Clawbot with the Controller in order to stack items to create a 'wall' for the castle.	Clawbot	No (run Drive Program)	Driving with the Controller
	Triple Transfer	Beginner	Students are asked to move items from one location to another using the V5 Controller and built in Driver Control Program on the V5 Brain.	Clawbot	No (run Drive Program)	Driving with the Controller
Weeks 13 & 14	Vision Sensor	Beginner	Students will explore a program that processes how the Vision Sensor input data should affect the Clawbot's behavior. This information will later be analyzed in the “Vision Data Challenge,” where students will analyze how the sensing blocks in VEXcode V5 Blocks use the data received from the VEX Vision Sensor to report values.	Clawbot	Yes (VEXcode V5)	Engineering Design (using the Vision Sensor)
Weeks 15 & 16	Speedy Delivery	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 17 & 18	Loop, There It Is!	Intermediate	Students are asked 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."	Clawbot	Yes (VEXcode V5)	Programming
Weeks 19 & 20	To Do, or Not To Do	Intermediate	Students will explore 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.	Clawbot	Yes (VEXcode V5)	Programming

Weeks 21 & 22	Clawbot with Controller	Intermediate	Students will explore programming the Controller to maneuver the Clawbot. They will analyze different ways to program the Controller by running different example projects such as Tank Drive and Clawbot Control.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 23 & 24	Stack Attack	Advanced	Students will explore different arm designs and investigate which design is best for stacking objects.	Clawbot	No (run Drive Program)	Engineering Design
Week 25	Put a Ring On It	Advanced	Students will investigate arm designs as they work to stack rings on posts using the Driver Control Program on the V5 Brain.	Clawbot	No (run Drive Program)	Engineering Design
Week 26	Gravity Rush	Advanced	Students will explore the VEX V5 Clawbot and the concept of the Center of Gravity. Students will drive the Clawbot over uneven surfaces with the its arm at different angles of it being raised and lowered.	Clawbot	No (run Drive Program)	Science: Center of Gravity
Weeks 27 & 28	Level Up	Advanced	Students are asked to create a 2D List in VEXcode V5 in order to move the arm of the Clawbot to different heights.	Clawbot	Yes (VEXcode V5)	Programming

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Weeks	STEM Lab	Level	Description	Build	Programming?	Key Concepts
Week 1	Robo Rally	Beginner	Students are asked to use proportional reasoning and scale to design a racetrack for the Speedbot.	Speedbot	No (run Drive Program)	Mathematical Reasoning
Week 2	Robosoccer	Beginner	Students are asked to build and utilize an extension to add to their Speedbot to dribble a ball and iterate on its design.	Speedbot	No (run Drive Program)	Engineering Design
Week 3	Medbot	Beginner	Students are asked to program a robot to deliver medication to patients on a hospital floor that they create. Students will learn how to program the Speedbot to drive forward, in reverse, turn left, and turn right.	Speedbot	Yes (VEXcode V5)	Programming
Week 4	Momentum Alley	Beginner	Students are asked to program a robot to knock down bowling pins (cans or water bottles) using momentum. They will explore how to program at different velocities.	Speedbot	Yes (VEXcode V5)	Science: Velocity and Momentum
Weeks 5 & 6	It's a Draw!	Beginner	Students will explore the VEX V5 Clawbot and using it as an artistic tool in a drawing game.	Clawbot	No (run Drive Program)	Artistic Skills
Weeks 7 & 8	Vision Sensor	Beginner	Students will explore a program that processes how the Vision Sensor input data should affect the Clawbot's behavior. This information will later be analyzed in the “Vision Data Challenge,” where students will analyze how the sensing blocks in VEXcode V5 Blocks use the data received from the VEX Vision Sensor to report values.	Clawbot	Yes (VEXcode V5)	Engineering Design (using the Vision Sensor)
Weeks 9 & 10	Speedy Delivery	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 11 & 12	Loop, There It Is!	Intermediate	Students are asked 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."	Clawbot	Yes (VEXcode V5)	Programming
Weeks 13 & 14	To Do, or Not To Do	Intermediate	Students will explore 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.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 15 & 16	Clawbot with Controller	Intermediate	Students will explore programming the Controller to maneuver the Clawbot. They will analyze different ways to program the Controller by running different example projects such as Tank Drive and Clawbot Control.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 17 & 18	Gravity Rush	Advanced	Students will explore the VEX V5 Clawbot and the concept of the Center of Gravity. Students will drive the Clawbot over uneven surfaces with the its arm at different angles of it being raised and lowered.	Clawbot	No (run Drive Program)	Science: Center of Gravity

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The following 12-Week Pacing Guide is coding focused and will first expose students to building the Speedbot robot. They will use this robot to begin studying programming concepts. Students will first gain experience with the build, before learning to program the robot to drive forward, in reverse, turn left, and turn right at different velocities.

Once the students have experience building and programming the Speedbot, then will then learn to build the Clawbot. The Clawbot has a similar base to the Speedbot, but allows for more manipulation with the addition of the Arm and Claw. With the Clawbot, students will first explore how to build it and then use it to study the engineering design process, science skills, and programming concepts.

Students will first use the Clawbot to explore the Vision Sensor and its capabilities before proceeding to program the Clawbot to maneuver obstacles utilizing the Arm and Claw. Students will learn important programming concepts such as loops and conditionals. Students will also gain experience utilizing the Controller with the Drive Program.

Weeks	STEM Lab	Level	Description	Build	Programming?	Key Concepts
Week 1	Medbot	Beginner	Students are asked to program a robot to deliver medication to patients on a hospital floor that they create. Students will learn how to program the Speedbot to drive forward, in reverse, turn left, and turn right.	Speedbot	Yes (VEXcode V5)	Programming
Week 2	Momentum Alley	Beginner	Students are asked to program a robot to knock down bowling pins (cans or water bottles) using momentum. They will explore how to program at different velocities.	Speedbot	Yes (VEXcode V5)	Programming
Weeks 3 & 4	Vision Sensor	Beginner	Students will explore a program that processes how the Vision Sensor input data should affect the Clawbot's behavior. This information will later be analyzed in the “Vision Data Challenge,” where students will analyze how the sensing blocks in VEXcode V5 Blocks use the data received from the VEX Vision Sensor to report values.	Clawbot	Yes (VEXcode V5)	Engineering Design (using the Vision Sensor)
Weeks 5 & 6	Speedy Delivery	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 7 & 8	Loop, There It Is!	Intermediate	Students are asked 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."	Clawbot	Yes (VEXcode V5)	Programming
Weeks 9 & 10	To Do, or Not To Do	Intermediate	Students will explore 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.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 11 & 12	Gravity Rush	Advanced	Students will explore the VEX V5 Clawbot and the concept of the Center of Gravity. Students will drive the Clawbot over uneven surfaces with the its arm at different angles of it being raised and lowered.	Clawbot	No (run Drive Program)	Science: Center of Gravity

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Weeks	STEM Lab	Level	Description	Build	Programming?	Key Concepts
Week 1	Mechanical Advantage	Beginner	Students will explore how mechanical advantages and gear ratios can be applied in their builds, daily lives, and in robotics competitions.	M.A.D. Box	No (build only)	Engineering Design
Week 2	Robo Rally	Beginner	Students are asked to use proportional reasoning and scale to design a racetrack for the Speedbot.	Speedbot	No (run Drive Program)	Mathematical Reasoning
Weeks 3 & 4	It's a Draw!	Beginner	Students will explore the VEX V5 Clawbot and using it as an artistic tool in a drawing game.	Clawbot	No (run Drive Program)	Artistic Skills
Weeks 5 & 6	Vision Sensor	Beginner	Students will explore a program that processes how the Vision Sensor input data should affect the Clawbot's behavior. This information will later be analyzed in the “Vision Data Challenge,” where students will analyze how the sensing blocks in VEXcode V5 Blocks use the data received from the VEX Vision Sensor to report values.	Clawbot	Yes (VEXcode V5)	Engineering Design (using the Vision Sensor)
Weeks 7 & 8	Speedy Delivery	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 9 & 10	Clawbot with Controller	Intermediate	Students will explore programming the Controller to maneuver the Clawbot. They will analyze different ways to program the Controller by running different example projects such as Tank Drive and Clawbot Control.	Clawbot	Yes (VEXcode V5)	Programming
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Weeks	STEM Lab	Level	Description	Build	Programming?	Key Concepts
Week 1	Medbot	Beginner	Students are asked to program a robot to deliver medication to patients on a hospital floor that they create. Students will learn how to program the Speedbot to drive forward, in reverse, turn left, and turn right.	Speedbot	Yes (VEXcode V5)	Programming
Weeks 2 & 3	Vision Sensor	Beginner	Students will explore a program that processes how the Vision Sensor input data should affect the Clawbot's behavior. This information will later be analyzed in the “Vision Data Challenge,” where students will analyze how the sensing blocks in VEXcode V5 Blocks use the data received from the VEX Vision Sensor to report values.	Clawbot	Yes (VEXcode V5)	Engineering Design (using the Vision Sensor)
Weeks 4 & 5	Speedy Delivery	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 6 & 7	Loop, There It Is!	Intermediate	Students are asked 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."	Clawbot	Yes (VEXcode V5)	Programming
Weeks 8 & 9	To Do, or Not To Do	Intermediate	Students will explore 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.	Clawbot	Yes (VEXcode V5)	Programming

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The following 9-Week Pacing Guide is engineering focused and will first expose students to building a M.A.D. Box and a Speedbot robot. The students will still be exposed to programming concepts, however, programming will not be the focus in all of the labs. The students will use the M.A.D. Box and the Speedbot to begin studying mathematical reasoning concepts and the engineering design process.

Once the students have experience building the M.A.D. Box and the Speedbot, they will then learn to build the Clawbot. The Clawbot has a similar base to the Speedbot, but allows for more manipulation with the addition of the Arm and Claw. With the Clawbot, students will first explore how to build it and then use it to study the engineering design process, artistic skills, and some programming concepts.

Students will first use the Clawbot to explore the Vision Sensor and its capabilities before proceeding to program the Clawbot to maneuver obstacles utilizing the Arm and Claw.

Weeks	STEM Lab	Level	Description	Build	Programming?	Key Concepts
Week 1	Mechanical Advantage	Beginner	Students will explore how mechanical advantages and gear ratios can be applied in their builds, daily lives, and in robotics competitions.	M.A.D. Box	No (build only)	Engineering Design
Week 2	Robo Rally	Beginner	Students are asked to use proportional reasoning and scale to design a racetrack for the Speedbot.	Speedbot	No (run Drive Program)	Mathematical Reasoning
Week 3	Robosoccer	Beginner	Students are asked to build and utilize an extension to add to their Speedbot to dribble a ball and iterate on its design.	Speedbot	No (run Drive Program)	Engineering Design
Weeks 4 & 5	It's a Draw!	Beginner	Students will explore the VEX V5 Clawbot and using it as an artistic tool in a drawing game.	Clawbot	No (run Drive Program)	Artistic Skills
Weeks 6 & 7	Vision Sensor	Beginner	Students will explore a program that processes how the Vision Sensor input data should affect the Clawbot's behavior. This information will later be analyzed in the “Vision Data Challenge,” where students will analyze how the sensing blocks in VEXcode V5 Blocks use the data received from the VEX Vision Sensor to report values.	Clawbot	Yes (VEXcode V5)	Engineering Design (using the Vision Sensor)
Weeks 8 & 9	Speedy Delivery	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes (VEXcode V5)	Programming

Summary:	STEM Labs are fun STEM engagements that align to educational standards. All STEM Labs contain activities that are structured around iterative, engineering design processes, real-world applications and opportunities for students to build teamwork and collaboration skills. STEM Labs provide students with hands-on, minds-on engagements that encourages students to design creative solutions and innovate through experimentation. STEM Labs are flexible enough to be used in any instructional setting (e.g. in-school, after-school, camps, VEX robotics teams/clubs, etc.) The following 6-Week Pacing Guide will first expose students to building the Speedbot robot. They will use this robot to begin studying programming concepts. Students will first gain experience with the build, before they program the robot to drive forward, in reverse, turn left, and turn right all at different velocities. Once the students have experience building and programming the Speedbot, then will then learn to build the Clawbot. The Clawbot has a similar base to the Speedbot, but allows for more manipulation with the addition of the Arm and Claw. With the Clawbot, students will first explore how to build it and then use it to study programming concepts. Students will program the Clawbot to maneuver obstacles utilizing the Arm and Claw. Students will also gain experience manipulating the Clawbot using the Controller with the Drive Program.

Weeks	STEM Lab	Level	Description	Build	Programming?	Key Concepts
Week 1	Medbot	Beginner	Students are asked to program a robot to deliver medication to patients on a hospital floor that they create. Students will learn how to program the Speedbot to drive forward, in reverse, turn left, and turn right.	Speedbot	Yes (VEXcode V5)	Programming
Week 2	Momentum Alley	Beginner	Students are asked to program a robot to knock down bowling pins (cans or water bottles) using momentum. They will explore how to program at different velocities.	Speedbot	Yes (VEXcode V5)	Programming
Weeks 3 & 4	Speedy Delivery	Intermediate	Students are asked to navigate a warehouse by programming the Claw and Arm of a Clawbot to grab and move packages to a loading dock for delivery.	Clawbot	Yes (VEXcode V5)	Programming
Weeks 5 & 6	Clawbot with Controller	Intermediate	Students will explore programming the Controller to maneuver the Clawbot. They will analyze different ways to program the Controller by running different example projects such as Tank Drive and Clawbot Control.	Clawbot	Yes (VEXcode V5)	Programming