

Weeks	STEM Lab	Level	Description	Build	Coding?	Key Concepts
<p>NOTE: This pacing guide is contingent upon purchase of Vex- V5 Robot Kits and is subject to change based on timingThis Pacing Guide covers a 26-Week progression using both V5 STEM Labs and EXP STEM Lab Units.</p> <ul style="list-style-type: none"> - 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. <p>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 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).</p> <p>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.</p>						
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 (EXP)	Beginner	Students will drive the BaseBot using the Controller, choose wheels, and add sensors 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)
Weeks 9 and 10	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 11 and 12	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 13 and 14	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 15 and 16	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
Weeks 17 and 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	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 its arm at different angles of it being raised and lowered.	Clawbot	No (run Drive Program)	Science: Center of Gravity
Week 30	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 30 and 31	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 32 and 33	Platform Placer (EXP) (Coming Soon)	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