

9 Week Competition Focus Scope and Sequence

This Scope and Sequence is intended to be a starting point for VEX IQ educators looking to start with a set 9-week scope of STEM Lab Units and Activities. This scope will explain how you can use these curricular materials while focusing on classroom-based competition topics. It is organized by week, so you can print out one page and reference it throughout the week to see what activities your students should be completing.

Looking for materials related to the VEX IQ Robotics Competition (VIQRC)? [Use the Competition 101 STEM Lab to support your students/team from the beginning of the season to their first competition and beyond.](#)

A column for the [VEX IQ Educator Certification](#) is also listed to show how you can complete the certification while teaching VEX IQ to your students. In this scope and sequence, you will complete the entire certification including the final exam.

All STEM Lab Units and Activities referenced in this scope and sequence will be linked. For more information about implementing 2nd gen STEM Lab Units or using VEX IQ activities in your classroom, see these articles:

- [Implementing STEM Lab Units with VEX IQ \(2nd gen\)](#)
- [Using VEX IQ Activities in the Classroom](#)

As you implement these curricular resources, it is important to understand how you will be organizing and facilitating classroom competitions and challenges. See these articles for more information.

- [Running an IQ STEM Lab Challenge](#)
- [Running an IQ STEM Lab Classroom Competition](#)
- [Facilitating an IQ STEM Lab Competition](#)

Week 1 - Introduction

Weekly Summary: Students will be introduced to the VEX IQ (2nd generation) Kit. Then they will build the BaseBot to get ready for the Team Freeze Tag competition.

VEX IQ Educator Certification: Complete [Unit 1: Getting Ready](#) and [Unit 8: Teaching with VEX IQ](#) before class

STEM Lab Units / Activities	Description
Scavenger Hunt Activity	Use the Interactive Parts Poster to learn more about the VEX IQ (2nd gen) Kit and find all the pieces described.
Team Freeze Tag Lesson 1: Introduction	Students will build the VEX IQ BaseBot and ensure the Controller and Battery are charged.

Differentiation:

- For students who need additional support getting started building, have them complete the [Advanced Scavenger Hunt](#).
- For students who complete the Lesson early, have them complete the [Driver Configurations activity](#) to begin driving their robot with the controller.

Week 2 - Team Freeze Tag Lesson 2

Weekly Summary: Students will begin driving their BaseBot with the controller and test different driver configurations.

VEX IQ Educator Certification: Complete [Unit 2: Controller](#) before class.

STEM Lab Units / Activities	Description
Team Freeze Tag Lesson 2: Driving with the IQ Controller	Students will learn about different driver configurations including: tank, split arcade, left arcade, and right arcade. They will test which configuration is best for them while driving in the practice and challenge activities.

Differentiation:

- For students who need additional practice driving the robot with the Controller, have them remove the cube from the Field and practice simply driving back and forth. Then they can work up to adding the cube for the [Drive Around a Cube Practice activity](#).
- For students who need an additional challenge, have them complete the [Navigate the Maze with Driver Control activity](#).

Week 3 - Team Freeze Tag Lesson 3

Weekly Summary: Students will learn about different VEX IQ wheels and how they affect the robot while driving. They will use this information in the Slalom Drive Challenge.

VEX IQ Educator Certification: Complete [Unit 7: Hardware Construction Techniques](#) before class.

STEM Lab Units / Activities	Description
Team Freeze Tag Lesson 3: Changing the Wheels	Students will learn about three different VEX IQ wheels and test different combinations of these wheels to determine which wheels are best for the task at hand.

Differentiation:

- For students who need additional support testing wheels, try changing the size of the Field. Try using a 3x4 Field to give them more room to maneuver around the cube on the Field in the [Test Wheels Practice activity](#).
- For students who need an additional challenge, have them test these different wheel configurations in the maze of the [Navigate the Maze with Driver Control activity](#).

Week 4 - Team Freeze Tag Lesson 4

Weekly Summary: Students will add a Bumper Switch and Touch LED to the BaseBot to compete in a game of one-on-one Freeze Tag.

VEX IQ Educator Certification: Complete [Unit 5: Sensors](#) and [Unit 6: Troubleshooting](#) before class.

STEM Lab Units / Activities	Description
Team Freeze Tag Lesson 4: Adding the Bumper Switch and Touch LED	Students will add sensors to their robot and code them to 'freeze' the robot and Controller when the Bumper Switch is pressed.

Differentiation:

- For students who need additional support during the [Bumper Press Practice activity](#), have them practice driving forward and backward to trigger the Bumper Switch. Ask them questions about how the robot responds when the Bumper Switch is pressed.
- For students who need an additional challenge, have them build the code for the Bumper Switch and Touch LED themselves in VEXcode IQ. Share the [example projects](#) listed here to help them get started:
 - Bumper Switch
 - Emergency Stop
 - Using Touch LED

Week 5 - Team Freeze Tag Lessons 5 and 6

Weekly Summary: Students will compete in the Team Freeze Tag Competition and then reflect on their learning experience and related STEM careers.

VEX IQ Educator Certification: Complete [Unit 9: Competitions](#) before class.

STEM Lab Units / Activities	Description
Team Freeze Tag Lesson 5: Competition	Students will plan for the final Team Freeze Tag Competition and compete!
Team Freeze Tag Lesson 6: Conclusion	Students will reflect on their learning with the debrief conversation and connect the Unit to related STEM Careers.

Differentiation:

- Have students complete multiple choice board options for their chosen career in the Conclusion lesson to extend the Unit.
 - [Career Choice Board](#)

Week 6 - Cube Collector Lessons 1 and 2

Weekly Summary: Students will build the Clawbot and drive the robot in the Speed Stack challenge.

STEM Lab Units / Activities	Description
Cube Collector Lesson 1: Introduction	Students will build the Clawbot. If they still have the BaseBot assembled from the previous Unit, they can remove the sensor additions from Lesson 4 and then add the arm and claw.
Cube Collector Lesson 2: Driver Control	Students will learn about different driver configurations and how to customize the Controller buttons for controlling the claw and arm of the Clawbot.

Differentiation:

- For students who need additional support in the [Stack and Score Practice activity](#), have them use only a single green cube rather than one green and one blue. Once they have successfully moved the single cube, you can add in the second.
- For students who need an additional challenge, have them stack both of the cubes in the [Stack and Score Practice activity](#).

Week 7 - Cube Collector Lesson 3

Weekly Summary: Students will be challenged to code their Clawbot in VEXcode IQ to complete the same challenges as in Lesson 2. They will learn about considerations for autonomous challenges and how to ensure repeatability and accuracy with code.

VEX IQ Educator Certification: Complete [Unit 3: Basic Movement](#) before class.

STEM Lab Units / Activities	Description
Cube Collector Lesson 3: Coding for Autonomous Movements	Students will learn about planning a path to complete the coding challenges, and then code their Clawbot to move and stack cubes in the practice and challenge activities.

Differentiation:

- For students who need additional support coding, have them watch the [tutorial videos](#) listed here:
 - Driving Forward and Backward
 - Turning
 - Opening the Claw
 - Moving the Arm
- For students who need an additional challenge, have them stack both of the cubes in the [Autonomous Movements Practice activity](#).

Week 8 - Cube Collector Lesson 4

Weekly Summary: Students will combine their skills from Lessons 2 and 3 to optimize driver strategy and customize the Controller using VEXcode IQ before competing in a challenge with driver control and autonomous runs.

VEX IQ Educator Certification: Complete [Unit 4: Programming Structures](#) before class.

STEM Lab Units / Activities	Description
Cube Collector Lesson 4: Using Multiple Programs	Students will take what they have learned about driver control and autonomous challenges and combine them to customize their controller and compete in a challenge with both driver control and autonomous runs.

Differentiation:

- If students are having trouble switching back and forth between practicing for autonomous and driver control runs, try structuring your days like this:
 - Day 1: Learn
 - Day 2: Autonomous Practice
 - Day 3: Autonomous Competition
 - Day 4: Driver Control Practice
 - Day 5: Driver Control Competition
- For students who need additional support coding, have them watch the [tutorial videos](#) listed here:
 - Using Events
 - If-Then-Else Blocks
 - Using Loops
- For students who need an additional challenge, have them add an additional two cubes to the Field in the [Scoring Skills Practice activity](#). How does this change their strategy?

Week 9 - Cube Collector Lessons 5 and 6

Weekly Summary: Students will compete in the Cube Collector Competition, then reflect on their learning experience and related STEM careers.

VEX IQ Educator Certification: Complete the [IQ Educator Certification Exam](#) before class.

STEM Lab Units / Activities	Description
Cube Collector Lesson 5: Competition	Students will plan for the final Cube Collector Competition and compete!
Cube Collector Lesson 6: Conclusion	Students will reflect on their learning with the debrief conversation and connect the Unit to related STEM Careers.

Differentiation:

- Have students complete multiple choice board options for their chosen career in the Conclusion lesson to extend the Unit.
 - [Career Choice Board](#)