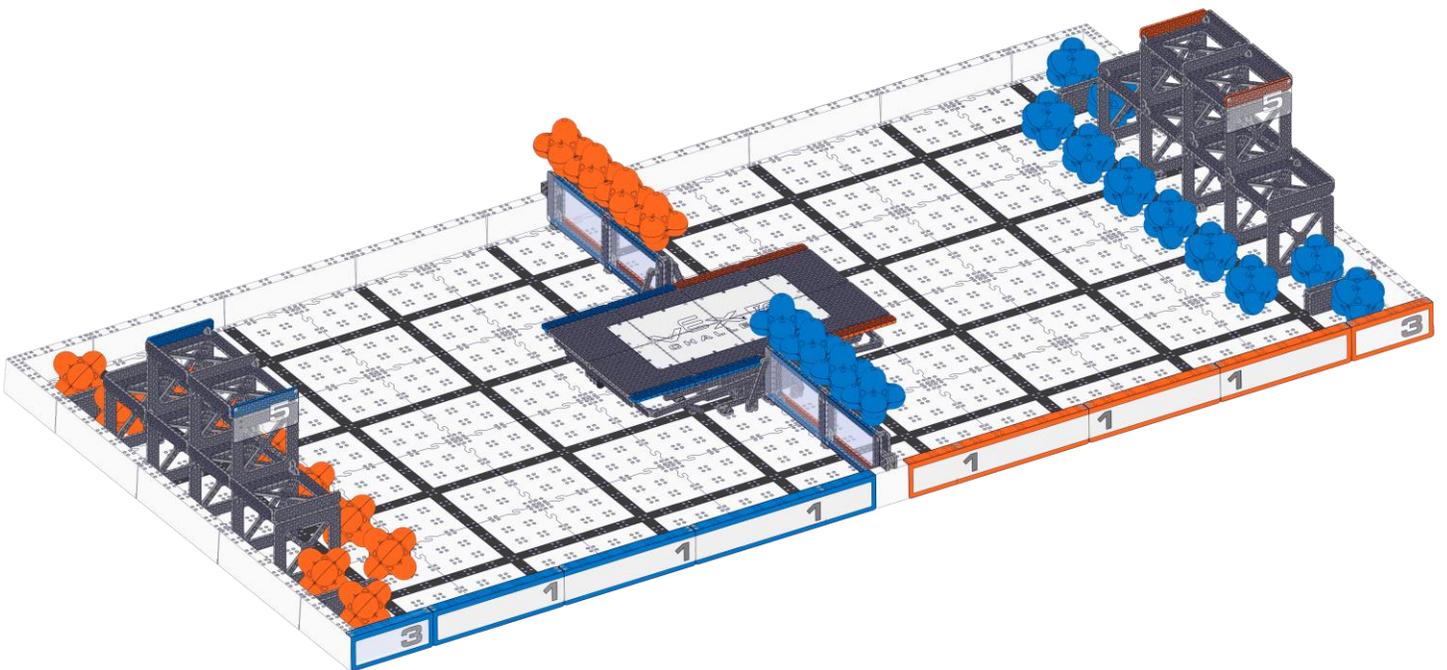




VEX[®] IQ CHALLENGE CROSSOVER

Quick Reference Guide





VEX IQ Challenge Crossover – Quick Reference Guide

The VEX IQ Challenge

Creativity and innovation are key elements to advancing the fields of science, technology, engineering and mathematics (STEM) into the future. The VEX IQ Challenge was designed to provide students with open-ended challenges that allow them to create and innovate using their hands and minds. Students then have the opportunity to develop real-world connections to what they are learning in the classroom.

Working with robots in a collaborative game format can be a very powerful tool to engage students and enhance their math and science skills through hands-on, student-centered learning. Through participation in the VEX IQ Challenge, students can develop the essential life skills of teamwork and collaboration, as well as the critical thinking, project management, and communication skills required to become the next generation of innovators and problem solvers in our global society.

The VEX IQ Challenge, presented by the Robotics Education & Competition (REC) Foundation, is designed to inspire students to develop a lifelong passion for learning and an interest in pursuing educational and career opportunities in STEM fields.

For additional information, visit www.vexiq.com and www.roboticseducation.org/vex-iq-challenge. You can also follow us on Twitter @VEXRobotics and @REC_Foundation. Like us on Facebook at www.facebook.com/vexrobotics and www.facebook.com/RECFoundation.

VEX IQ Challenge Crossover – A Primer

VEX IQ Challenge Crossover is played on a 4 ft x 8 ft field, surrounded by a 2.5 inch tall perimeter.

There are a total of twenty-eight (28) Hexballs available as scoring objects in the game, two (2) Scoring Zones, sixteen (16) Low Goals, twelve (12) Elevated Goals, and one (1) Bridge on the field.

The Challenge theme this season is Technology. The Challenge includes the exciting Crossover robot game and the STEM Research Project. For more details on the STEM Research Project, visit www.roboticseducation.org/vex-iq-challenge/viq-current-game/

VEX IQ Challenge Crossover provides an opportunity for students, with the guidance of an adult mentor, to build a VEX IQ robot to solve exciting engineering challenges. Students collaborate with their own teammates and with other teams in a teamwork format to Score Hexballs in their colored Scoring Zone and Goals, and by Parking and Balancing Robots on the Bridge. Students develop a tremendous sense of accomplishment in building a robot to solve the VEX IQ Challenge. Teachers, mentors, and parents will take pride in the fact that students are able to design, build, and program a VEX IQ robot with minimal adult assistance.

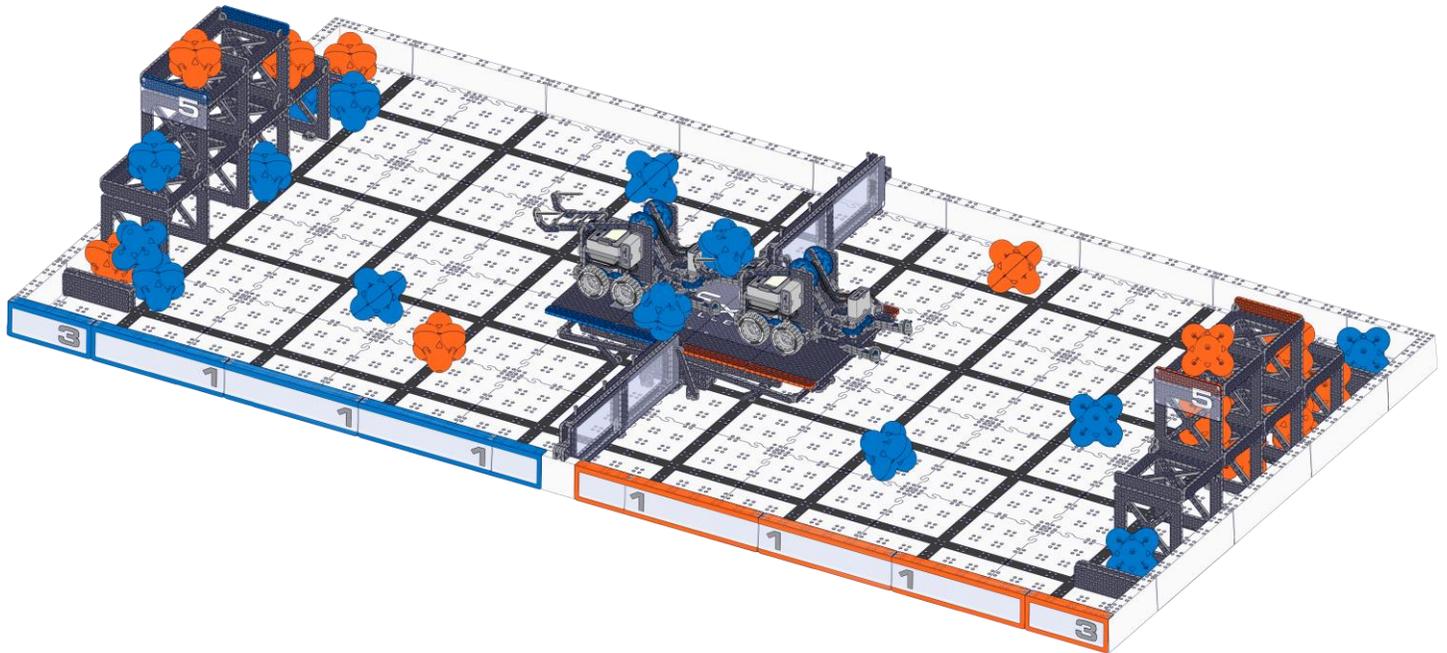
**PLEASE SEE GAME MANUAL FOR RULE DETAILS AND ADDITIONAL EVENT INFORMATION.
PLEASE SEE ROBOTICSEDUCATION.ORG FOR STEM RESEARCH PROJECT AND AWARD INFORMATION.**

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Game Rules

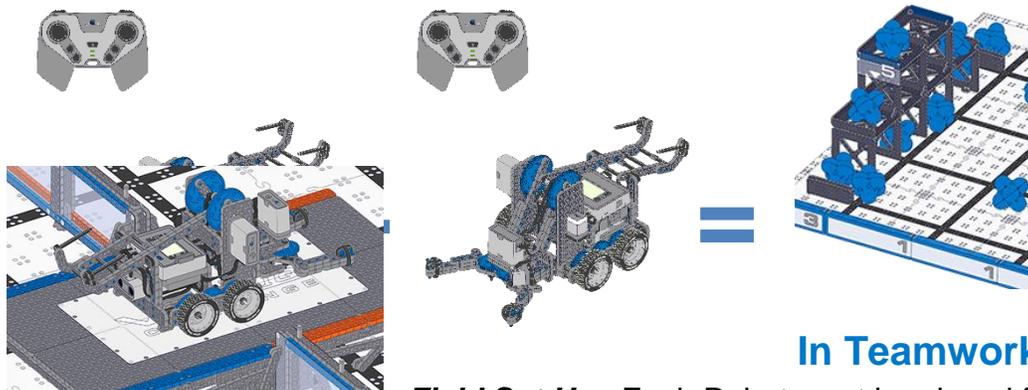
Object of the Game

The object of the game is to attain the highest score by Scoring Hexballs in their colored Scoring Zone and Goals, and by Parking and Balancing Robots on the Bridge.



1. Teamwork Challenge Matches

Two teams will collaborate in 60-second Teamwork Challenge Matches, working together to maximize their score. Teams work together to score Hexballs in their colored Scoring Zone and Goals, and to Park and Balance Robots on the Bridge. Both teams will receive the same total points at the end of each Teamwork Challenge Match.



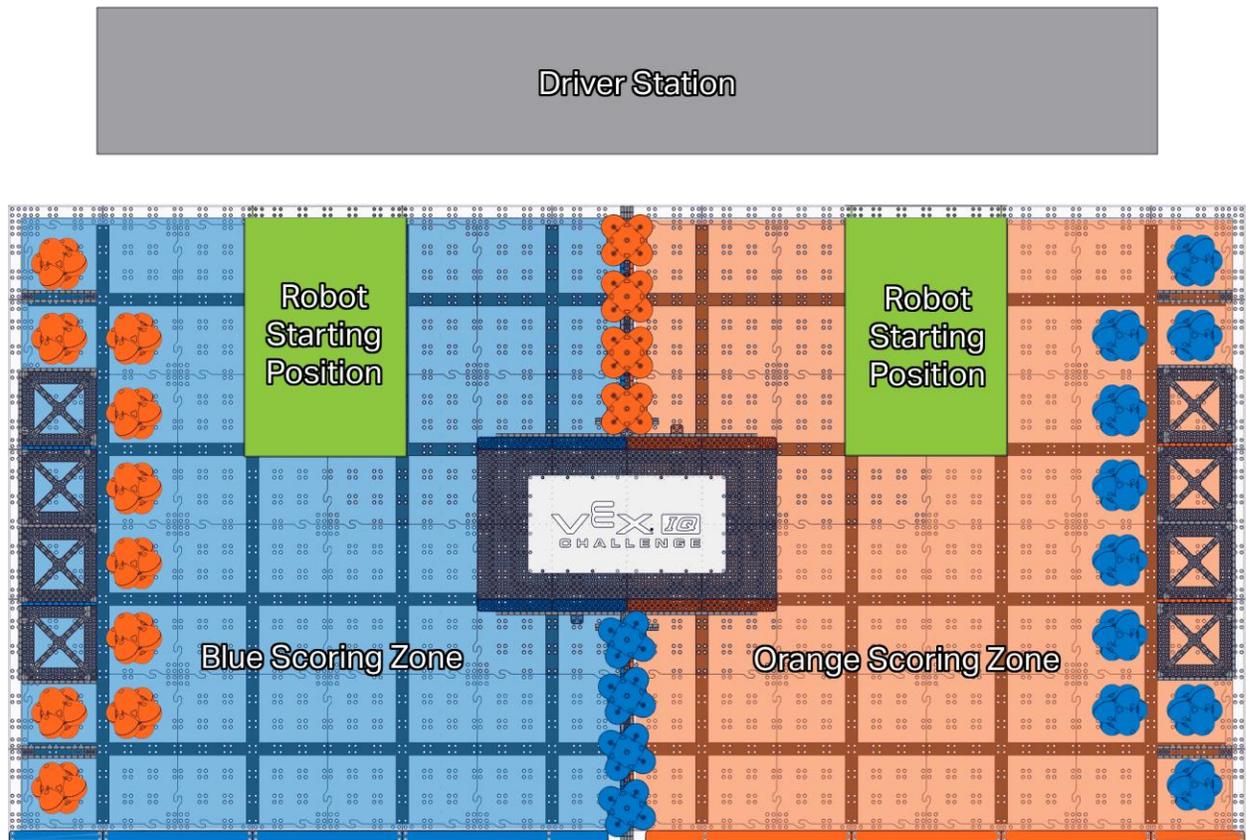
In Teamwork Challenge Matches

Field Set-Up - Each Robot must be placed fully within one of the two 13" x 20" Robot Starting Positions before the start of each Match. The 28 Hexballs are set up prior to

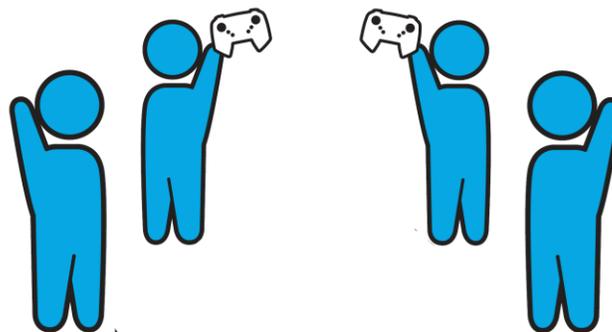
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each Match as shown in the Field Set-Up Diagram. All drivers position themselves in the Driver Station for each Match.

Field Set-Up Diagram



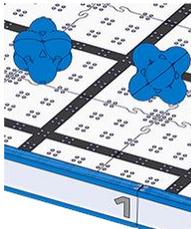
Robot Operation - Each team has two Drivers that operate their team's Robot with the Controller, one at a time. The Drivers switch between :25 and :35 remaining in each Match with a Controller handoff.



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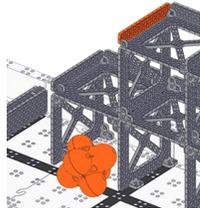
Scoring – Scoring is done at the end of each 60-second Match, after all Hexballs, Robots and the Bridge come to rest.

Hexball in Scoring Zone
= 1 point



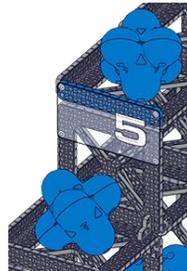
These Hexballs are Scored in their colored Scoring Zone. They are touching the Zone and not touching a Robot.

Hexball in Low Goal
= 3 points



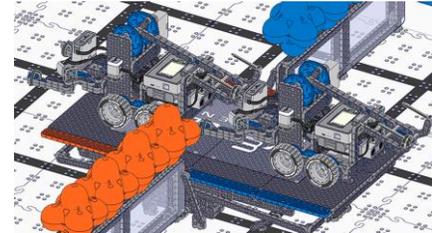
This Hexball is Scored in a Low Goal. It is at least partially within the three dimensional volume of the Goal of the same color and not touching a Robot.

Hexball in Elevated Goal
= 5 points

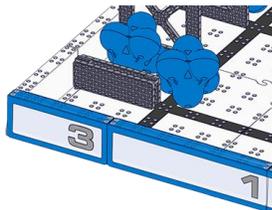


These Hexballs are Scored in Elevated Goals. They are at least partially within the three dimensional volume of the Goal of the same color and not touching a Robot.

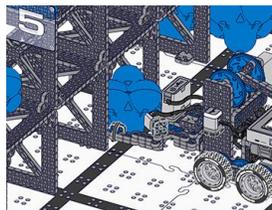
1 Robot Parked on Bridge = 5 points
2 Robots Parked on Bridge = 15 points
All Robots Balanced on Bridge = 25 points



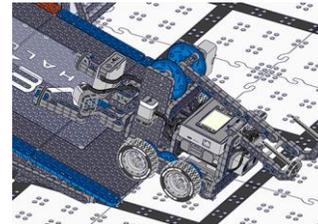
All Robots are Balanced on the Bridge. The Bridge is considered Balanced if neither end of the Bridge is touching the Floor or is supported by a Hexball.



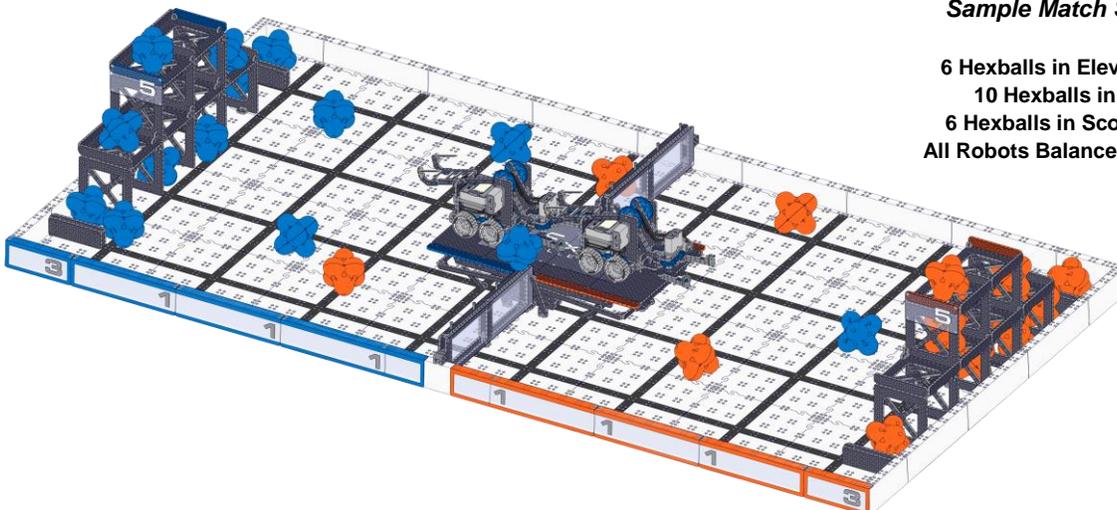
Only one Hexball can count as Scored in a Goal. The other here counts as Scored in the Scoring Zone.



This Hexball is NOT Scored. It's being touched by a Robot



This Robot is NOT Parked. It is touching the Bridge, BUT it is also touching the Floor.



Sample Match Score Calculation

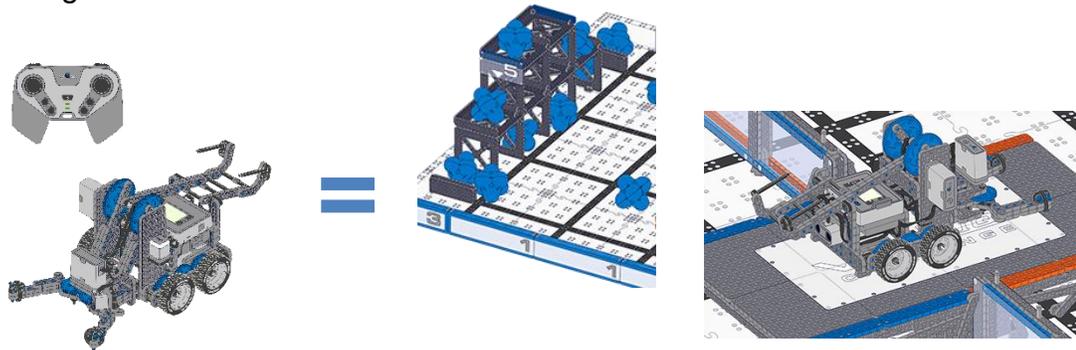
6 Hexballs in Elevated Goals = 30 points
10 Hexballs in Low Goals = 30 points
6 Hexballs in Scoring Zones = 6 points
All Robots Balanced on Bridge = 25 points

Total = 91 points

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2. Robot Skills Challenge Matches

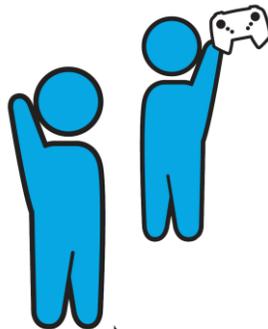
In Robot Skills Challenge Matches, there are also 60-seconds of driver controlled time to score as many points as possible, but this time it's as an individual team. Just like Teamwork Challenge Matches, the team will score Hexballs in their colored Scoring Zone and Goals, and Park or Balance its Robot on the Bridge.



In Robot Skills Challenge Matches

Field Set-Up - The single Robot must be placed in one of the two pre-defined starting positions before the start of each Match. The rest of the field is set up exactly the same way as it is in Teamwork Challenge Matches.

Robot Operation – Same as Teamwork Skills Challenge Matches, except that only one team is operating a Robot. The Drivers switch between :25 and :35 remaining in each Match with a controller handoff.

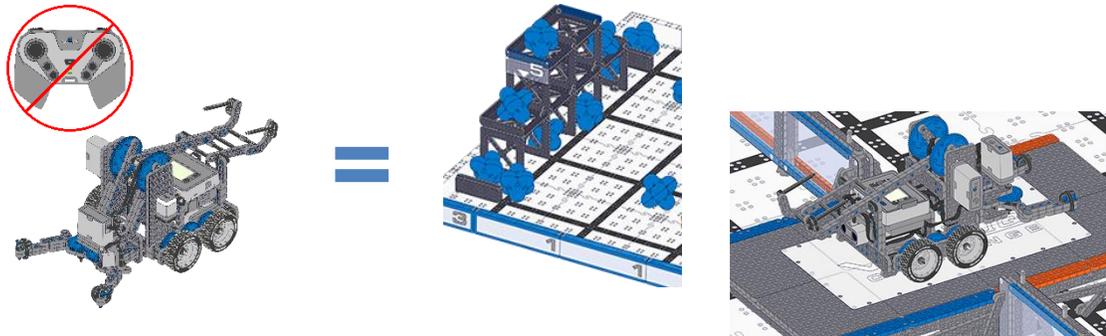


Scoring - Same as Teamwork Challenge Matches. Although there is only one Robot in the Match, “All Robots” Balanced on the Bridge still equals 25 points. A Hexball in its Scoring Zone is worth 1 point, a Hexball in one of its Low Goals is worth 3 points, a Hexball in one of its Elevated Goals is worth 5 points, and the Robot Parked on Bridge is 5 points.

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3. Programming Skills Challenge Matches

During the 60-second Programming Skills Challenge Matches, a single team's robot scores as many points as possible using only sensors and preprogrammed instructions stored in the VEX IQ Robot Brain. Robots will score Hexballs in their colored Scoring Zone and Goals, and Park or Balance on the Bridge.



In Programming Skills Challenge Matches

Field Set-Up – Exactly the same as Robot Skills Challenge Matches. The Robot must be placed in one of the two pre-defined starting positions before the start of each Match.

Robot Operation - The Driver activates programs using the buttons on the Robot Brain or sensors attached to the Robot. Controllers are brought to the field but not used. Drivers may handle and/or retrieve robots from the field of play and return them immediately to a legal re-start position as often as necessary to activate programs.



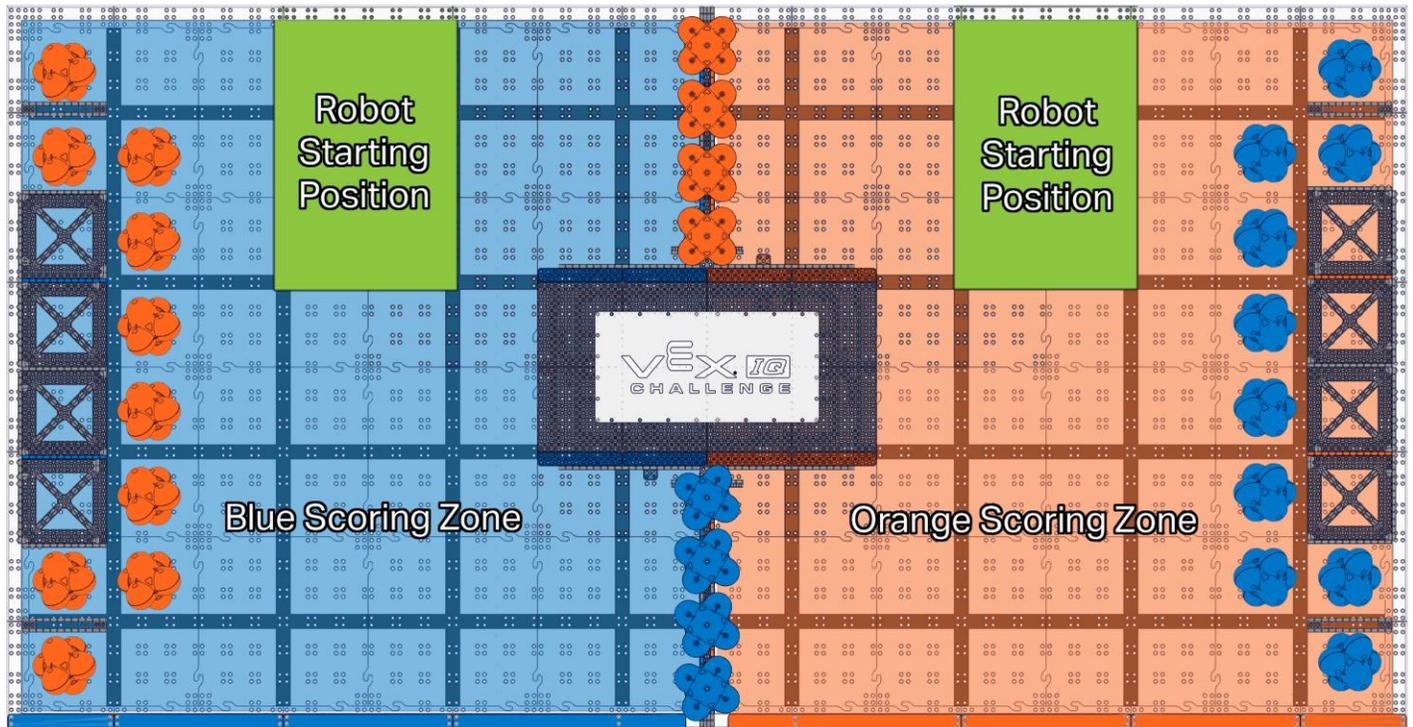
Scoring - Same as Robot Skills Challenge Matches. Although there is only one Robot in the Match, “All Robots” Balanced on the Bridge still equals 25 points. A Hexball in its Scoring Zone is worth 1 point, a Hexball in one of its Low Goals is worth 3 points, a Hexball in one of its Elevated Goals is worth 5 points, and the Robot Parked on Bridge is 5 points.

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Additional Game Rules

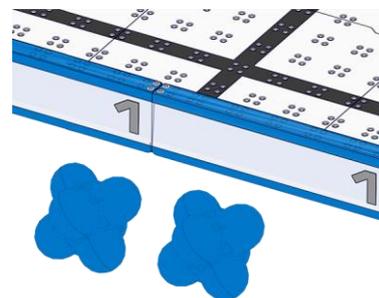
Driver Station – The region beside the Field, where the Drivers must remain during their Match, unless legally interacting with their Robot.

NOTE: This is a change from last season's Driver Station Location.



Out of Play Game Objects – Hexballs that leave the playing field will be promptly returned to the playing field at the location nearest the point at which they exited. If the nearest point to which it exited is in a Goal it will be returned to a spot that is adjacent to and not in the Goal.

NOTE: This is a change from last season's Game Rules.



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Robot Inspection Rules

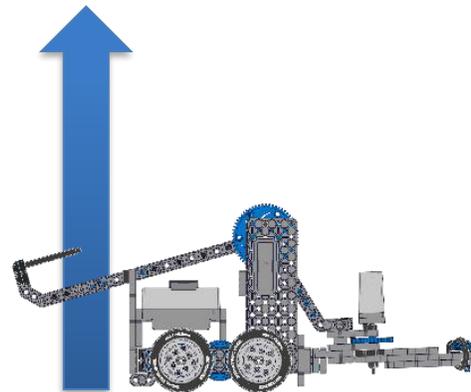
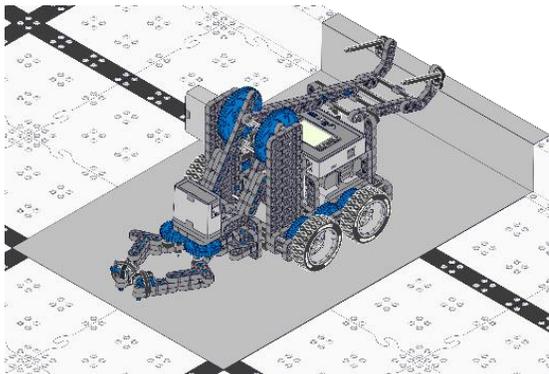
Robot Inspection

- All VEX IQ Challenge Robots must pass a full inspection prior to Match play.
- Each team may ONLY inspect and use ONE Robot at any VEX IQ Challenge Event.
- Each Robot must display its official team number using the official VEX IQ Challenge License Plates supplied when a Team completes its official registration. Both plates should be mounted on the Robot facing two opposing sides.



Robot Sizing

- At the start of any Match, a VEX IQ Challenge Robot must ONLY touch the floor and fit within a 13" x 20" x 15" tall volume.



- Robots MAY NOT expand beyond the 13" x 20" at ANY time, but MAY expand beyond 15" tall after the start of a Match.

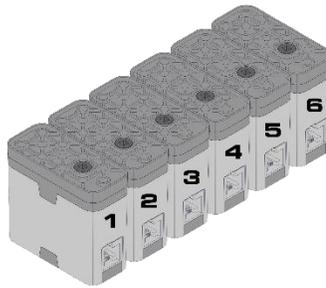
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Robot Construction

- Robots may only be built from official Robot components from the VEX IQ Product Line or mechanical/structural components from the VEX Robotics by Hexbug product line. See www.vexiq.com for details.
- Non-functional decorations are also allowed
- A VEX IQ Challenge Robot places limits on the following components:



*One VEX IQ Robot Brain and
One VEX IQ Robot Battery or Six AA Batteries*



Up to Six VEX IQ Smart Motors



One VEX IQ Controller

- The following types of mechanisms are NOT allowed:
 - Those that could potentially damage the playing field or field elements
 - Those that could potentially damage other Robots
 - Those that pose an unnecessary risk of entanglement

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