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Changelog

Version 2.2 - December 6, 2022
• Minor typo fixes

Version 2.1 - October 4, 2022
• Updated <SC1> to clarify handling of Discs that were scored after the Match has ended.
• Updated <G6> to clarify that a Team utilizing a single Driver may only drive during the first thirty five (0:35) seconds of the Match.
• Updated Appendix B to include Robot Skills Challenge Rankings for League Events

Version 2.0 - July 27, 2022
• Corrected Figure 9 to accurately display the boundaries of the Contact Zones and Goal Zones
• Added a Blue Box to <SC5> to clarify intent
• Added two new figures to <SC5> to clarify intent, and updated all subsequent figure numbers
• Replaced <T15> with a new rule stating that Fields may be repaired at the Event Partner’s discretion
• Added a new bullet point to <R13> stating that it is legal to bend parts which are intended to be flexible
• Added rules for Live Remote Skills to Appendix B

Version 1.1 - July 19, 2022
• Added a note to <G11> stating that the Purple Dispenser must be spun counter-clockwise

Version 1.0 - June 28, 2022
• Corrected Figures throughout the Manual to show the Purple Dispenser Arms in their correct starting position
• Added a new drawing to Appendix A to note the correct starting position of the Purple Dispenser Arm

Version 0.2 - June 14, 2022
• Corrected Figures throughout the Manual that showed an incorrect version of the Yellow Dispenser
• Added a Figure number to the Violation Flowchart (Figure 4), and updated all subsequent Figure numbers
• Updated the weight of Discs to 0.02 lbs (10 grams)
• Added a new drawing to Appendix A to note the proper way to assemble the Purple Dispenser
• Updated links for the Code of Conduct and Student-Centered Policy
• Minor typo fixes

Version 0.1 - May 10, 2022
• Initial Release
# Quick Reference Guide

## Scoring Rules (Pages 13-15)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;SC1&gt;</strong></td>
<td>All Scoring statuses are evaluated immediately after the Match ends.</td>
</tr>
<tr>
<td><strong>&lt;SC2&gt;</strong></td>
<td>Each Disc that is Scored in a Goal Zone is worth the point value corresponding to that Zone.</td>
</tr>
<tr>
<td><strong>&lt;SC3&gt;</strong></td>
<td>Disc Scoring examples, per the criteria listed in &lt;SC2&gt;.</td>
</tr>
<tr>
<td><strong>&lt;SC4&gt;</strong></td>
<td>A Robot achieves the Contact Bonus if any part of their Robot is contacting the Floor inside of a Contact Zone.</td>
</tr>
<tr>
<td><strong>&lt;SC5&gt;</strong></td>
<td>Each Disc that is Removed from a Dispenser receives one point.</td>
</tr>
</tbody>
</table>

## Safety Rules (Page 16)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;S1&gt;</strong></td>
<td>Stay safe, don’t damage the Field.</td>
</tr>
</tbody>
</table>

## General Game Rules (Pages 16-24)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt;G1&gt;</strong></td>
<td>Treat everyone with respect.</td>
</tr>
<tr>
<td><strong>&lt;G2&gt;</strong></td>
<td>VEX IQ is a student-centered program.</td>
</tr>
<tr>
<td><strong>&lt;G3&gt;</strong></td>
<td>Use common sense.</td>
</tr>
<tr>
<td><strong>&lt;G4&gt;</strong></td>
<td>The Robot must represent the skill level of the Team.</td>
</tr>
<tr>
<td><strong>&lt;G5&gt;</strong></td>
<td>Pre-Match setup.</td>
</tr>
<tr>
<td><strong>&lt;G6&gt;</strong></td>
<td>Drivers switch controllers midway through the Match.</td>
</tr>
<tr>
<td><strong>&lt;G7&gt;</strong></td>
<td>Drivers drive your Robot, and stay in the Driver Station.</td>
</tr>
<tr>
<td><strong>&lt;G8&gt;</strong></td>
<td>Hands out of the Field.</td>
</tr>
<tr>
<td><strong>&lt;G9&gt;</strong></td>
<td>Keep Discs in the Field.</td>
</tr>
<tr>
<td><strong>&lt;G10&gt;</strong></td>
<td>Keep your Robot together.</td>
</tr>
<tr>
<td><strong>&lt;G11&gt;</strong></td>
<td>Don’t damage the Field.</td>
</tr>
<tr>
<td><strong>&lt;G12&gt;</strong></td>
<td>Handling the Robot mid-Match is allowed under certain circumstances.</td>
</tr>
<tr>
<td><strong>&lt;G13&gt;</strong></td>
<td>Horizontal expansion is limited during a Match.</td>
</tr>
<tr>
<td><strong>&lt;G14&gt;</strong></td>
<td>Don’t cross the Fence Line until Contact.</td>
</tr>
<tr>
<td><strong>&lt;G15&gt;</strong></td>
<td>Discs that have crossed the Fence are “off limits”.</td>
</tr>
<tr>
<td><strong>&lt;G16&gt;</strong></td>
<td>Discs go under the Fence, not over it.</td>
</tr>
</tbody>
</table>
# Robot Rules (Pages 25-31)

<table>
<thead>
<tr>
<th>R1</th>
<th>One Robot per Team.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2</td>
<td>Robots must represent the Team’s skill level.</td>
</tr>
<tr>
<td>R3</td>
<td>Robots must pass inspection.</td>
</tr>
<tr>
<td>R4</td>
<td>Officially registered Team numbers must be displayed on Robot License Plates.</td>
</tr>
<tr>
<td>R5</td>
<td>Starting configuration.</td>
</tr>
<tr>
<td>R6</td>
<td>The Match configuration will be inspected.</td>
</tr>
<tr>
<td>R7</td>
<td>VEX IQ product line.</td>
</tr>
<tr>
<td>R8</td>
<td>Non-VEX IQ components.</td>
</tr>
<tr>
<td>R9</td>
<td>Microcontroller.</td>
</tr>
<tr>
<td>R10</td>
<td>Motors.</td>
</tr>
<tr>
<td>R11</td>
<td>Batteries.</td>
</tr>
<tr>
<td>R12</td>
<td>Firmware.</td>
</tr>
<tr>
<td>R13</td>
<td>Modifications of parts.</td>
</tr>
<tr>
<td>R14</td>
<td>Prohibited items.</td>
</tr>
<tr>
<td>R15</td>
<td>Let it go after the Match is over.</td>
</tr>
</tbody>
</table>

# Tournament Rules (Pages 33-37)

<table>
<thead>
<tr>
<th>T1</th>
<th>The Head Referee has ultimate authority on ruling decisions during the competition.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2</td>
<td>Head Referees must be qualified.</td>
</tr>
<tr>
<td>T3</td>
<td>The Drivers are permitted to immediately appeal the Head Referee’s ruling.</td>
</tr>
<tr>
<td>T4</td>
<td>Teamwork Matches.</td>
</tr>
<tr>
<td>T5</td>
<td>Timeouts.</td>
</tr>
<tr>
<td>T6</td>
<td>Ending a Match early.</td>
</tr>
<tr>
<td>T7</td>
<td>Practice Matches may be played at some events, but are not required.</td>
</tr>
<tr>
<td>T8</td>
<td>Qualification Matches will occur according to the official match schedule.</td>
</tr>
<tr>
<td>T9</td>
<td>Each Team will be scheduled Qualification Matches as follows.</td>
</tr>
<tr>
<td>T10</td>
<td>Teams are ranked by their average Qualification Match scores.</td>
</tr>
<tr>
<td>T11</td>
<td>Be at your Match on time.</td>
</tr>
<tr>
<td>T12</td>
<td>Disqualifications.</td>
</tr>
<tr>
<td>T13</td>
<td>Teams playing in Finals Matches.</td>
</tr>
<tr>
<td>T14</td>
<td>Finals Match Schedule.</td>
</tr>
<tr>
<td>T15</td>
<td>Fields may be repaired at the Event Partner’s discretion.</td>
</tr>
<tr>
<td>T16</td>
<td>Students must be accompanied by an Adult.</td>
</tr>
<tr>
<td>T17</td>
<td>Robots at the Field must be ready to play.</td>
</tr>
<tr>
<td>T18</td>
<td>Be prepared for minor Field variance.</td>
</tr>
<tr>
<td>T19</td>
<td>Match Replays are allowed, but rare.</td>
</tr>
<tr>
<td>T20</td>
<td>The Event Partner has ultimate authority regarding all non-gameplay decisions during an event.</td>
</tr>
</tbody>
</table>
## Robot Skills Challenge Rules (Pages B2-B4)

<table>
<thead>
<tr>
<th>&lt;RSC1&gt;</th>
<th>Standard rules apply in most cases.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;RSC2&gt;</td>
<td>Skills Scoring and Ranking at events.</td>
</tr>
<tr>
<td>&lt;RSC3&gt;</td>
<td>Skills Rankings Globally.</td>
</tr>
<tr>
<td>&lt;RSC4&gt;</td>
<td>Skills Match Schedule.</td>
</tr>
<tr>
<td>&lt;RSC5&gt;</td>
<td>Handling Robots during a Programming Skills Match.</td>
</tr>
<tr>
<td>&lt;RSC6&gt;</td>
<td>Starting a Programming Skills Match.</td>
</tr>
</tbody>
</table>
Section 1
The Game

Game Description

VEX IQ Competition (VIQC) Slapshot is played on a 6’ x 8’ rectangular Field, set up as illustrated in the figures throughout this manual.

The object of the game is to score points by Removing Discs from Dispensers, by placing Discs into Goal Zones, and by getting Contact Bonuses at the end of the Match.

In the Teamwork Challenge, an Alliance composed of two (2) Robots works together to score as many points as possible in a sixty (60) second Match.

Teams may also compete in Robot Skills Challenge Matches, where one (1) Robot tries to score as many points as possible. See Appendix B for more information.

Figure 1: Starting configuration of the Field for a VEX IQ Competition Slapshot Match.
About the Game Manual - A Note from the GDC

This Game Manual and its appendices contain everything there is to know about this season’s new game, VEX IQ Competition Slapshot. It is intended to be a resource for all Teams, Head Referees, Event Partners, and other members of the VIQC community.

The rules contained in the following pages can be thought of as “constraints” that define this game, just as engineers begin any design project by defining their constraints. At the beginning of a season, “constraints” are all we have. We don’t know what the winning Robot, best strategy, or most frequently-violated rule will be any more than you do. Isn’t that exciting?

When exploring a new game, please approach this Game Manual with that mentality, and look at rules as “constraints.” The Game Manual and its appendices contain the full and complete list of constraints that are available for a competitor to strategize, design, and build their Robots.

Obviously, all Teams must adhere to these rules, and any stated intents of these rules. However, beyond that, there is no “right” way to play. There are no hidden restrictions, assumptions, or intended interpretations beyond what is written here. So, it is up to you, the competitor, to find the path through these constraints that best suits your team’s goals and ambitions.

Figure 2: Starting configuration of the Field for a VEX IQ Competition Slapshot Match.
Updates

This manual will have a series of “major” and “minor” updates over the course of the season. Each version is official and must be used in official VIQC events until the release of the next version, upon which the previous version becomes void.

Known major release dates are as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 10, 2022</td>
<td>Version 0.1</td>
<td>Initial game release</td>
</tr>
<tr>
<td>May 31, 2022</td>
<td>(N/A)</td>
<td>Official Q&amp;A system opens</td>
</tr>
<tr>
<td>June 14, 2022</td>
<td>Version 0.2</td>
<td>Minor typographical errors or formatting issues found in the initial release; very few rule changes, if any</td>
</tr>
<tr>
<td>June 28, 2022</td>
<td>Version 1.0</td>
<td>May include critical gameplay or rule changes inspired by input from the official Q&amp;A system and the VEX community</td>
</tr>
<tr>
<td>July 19, 2022</td>
<td>Version 1.1</td>
<td>Unscheduled update</td>
</tr>
<tr>
<td>August 2, 2022</td>
<td>Version 2.0</td>
<td>May include gameplay or rule changes inspired by early-season events</td>
</tr>
<tr>
<td>October 4, 2022</td>
<td>Version 2.1</td>
<td>Clarification update only</td>
</tr>
<tr>
<td>December 6, 2022</td>
<td>Version 2.2</td>
<td>Clarification update only</td>
</tr>
<tr>
<td>January 31, 2023</td>
<td>Version 3.0</td>
<td>May include gameplay or rule changes inspired by mid-season events</td>
</tr>
<tr>
<td>April 4, 2023</td>
<td>Version 4.0</td>
<td>May include critical gameplay or rule clarifications pertaining specifically to the VEX Robotics World Championship</td>
</tr>
</tbody>
</table>

In addition to these known major updates, there may also be unscheduled updates released throughout the season if deemed critical by the VEX GDC. Any unscheduled updates will always be released on a Tuesday, no later than 5:00 PM CST (11:00 PM GMT). These updates will be announced via the VEX Forum, automatically pushed to the VIQC Hub app, and shared via VEX Robotics / REC Foundation social media & email marketing channels.

Game Manual updates are effective immediately upon release; it is every Team’s responsibility to be familiar with all rules and updates. There are no “grace periods” if an update prohibits a previously legal part, mechanism, or strategy.

Note: REC Foundation Event Support Managers will contact Event Partners involved with multi-week league events that “cross over” an unscheduled update. If a rule change impacts their event (such as a Robot which previously passed inspection no longer being legal), these cases will be reviewed individually depending on the context of the event and the rule that has changed. This is the only possible “grace period” exception.
The Q&A System

When first reviewing a new robotics game, it is natural to have questions about situations which may not be immediately clear. Navigating the Game Manual and seeking out answers to these questions is an important part of learning a new game. In many cases, the answer may just be in a different place than you first thought. Or, if there is no rule explicitly prohibiting something, then that usually means it is legal!

However, if a Team is still unable to find an answer to their question after closely reviewing the relevant rules, then every Team has the opportunity to ask for official rules interpretations in the VEX IQ Competition Q&A System.

All responses in this Q&A system should be treated as official rulings from the VEX IQ Competition Game Design Committee, and they represent the correct and official interpretation of the VEX IQ Competition Rules. The Q&A system is the only source other than the Game Manual for official rulings and clarifications.

The VIQC Q&A System can be found at https://www.robotevents.com/VIQC/2022-2023/QA.

Before posting on the Q&A system, be sure to review the Q&A Usage Guidelines, which can be found at https://www.robotevents.com/VIQC/2022-2023/QA/guidelines.

In brief:

1. Read and search the manual before posting.
2. Read and search existing Q&As before posting.
3. Quote the applicable rule from the latest version of the manual in your question.
4. Make a separate post for each question.
5. Use specific and appropriate question titles.
6. Questions will (mostly) be answered in the order they were received.
7. This system is the only source for official rules clarifications.

If there are any conflicts between the Game Manual and other supplemental materials (e.g, Referee Certification courses, the VIQC Hub app, etc.), the most current version of the Game Manual takes precedence.

Similarly, it can never be assumed that definitions, rules, or other materials from previous seasons apply to the current game. Q&A responses from previous seasons are not considered official rulings for the current game. Any relevant clarifications that are needed should always be re-asked in the current season’s Q&A.
General Definitions

**Adult** - Anyone who is not a **Student**.

**Alliance** - A pre-assigned grouping of two (2) **Teams** that are paired together during a given Teamwork **Match**.

**Alliance Score** - Points scored in a Teamwork **Match** that are awarded to both **Teams**.

**Disablement** - A penalty applied to a **Team** for a rule violation. During **Disablement**, a **Team** is no longer allowed to operate their **Robot**, and the **Drivers** will be asked to place their Controller on the ground. A **Disablement** is not the same as a **Disqualification**.

**Disqualification** - A penalty applied to a **Team** for a rule violation (see <T12> for more details). If a **Team** is Disqualified in a **Match**, the **Head Referee** will notify the **Team** of their violation at the end of the **Match**. At the **Head Referee**’s discretion, repeated violations and/or **Disqualifications** for a single **Team** may lead to its **Disqualification** for the entire event.

**Driver** - A **Student Team** member who stands in the **Driver Station** and is responsible for operating and controlling the **Team’s Robot**. Up to two **Team** members per **Team** may fulfill this role in a given **Match** (see <G6>).

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

![Figure 3: The Driver Station configuration for VEX IQ Slapshot.](image-url)
Field - The entire playing Field, being six (6) field tiles wide by eight (8) field tiles long (totalling forty-eight (48) field tiles), including the Field Perimeter.

Field Element - All elements that make up the Field, including the Field Perimeter, Floor, PVC pipes, and any VEX IQ parts attached to any of the above.

Field Perimeter - The outer part of the Field, made up of four (4) outside corners and twenty-four (24) straight sections.

Floor - The interior flat part of the playing Field, made up of the forty-eight (48) field tiles that are within the Field Perimeter.

Game Design Committee (GDC) - The creators of VIQC Slapshot, and authors of this Game Manual.

License Plate - A physical component on the Robot that has the Team’s VEX IQ Competition number displayed. The License Plate must have a length and height of 3.5” x 1.5” (88.9mm x 38.1mm) and must not exceed a width of 0.25” (6.35mm) per <R4>.

Match - A set time period during which Teams play a defined version of Slapshot to earn points. See Section 3.

• Autonomous Period - A time period during which Robots operate and react only to sensor inputs and to commands pre-programmed by the Students into the Robot control system.

• Driver Controlled Period - A time period during which Drivers operate their Robot.

<table>
<thead>
<tr>
<th>Match Type</th>
<th>Participants</th>
<th>Autonomous Period (m:ss)</th>
<th>Driver Controlled Period (m:ss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork Challenge</td>
<td>One Alliance, on one Field, made up of two Teams, each with one Robot</td>
<td>None</td>
<td>1:00</td>
</tr>
<tr>
<td>Driver Skills Challenge</td>
<td>One Team, with one Robot</td>
<td>None</td>
<td>1:00</td>
</tr>
<tr>
<td>Programming Skills Challenge</td>
<td>One Team, with one Robot</td>
<td>1:00</td>
<td>None</td>
</tr>
</tbody>
</table>

Robot - A machine that has passed inspection, designed to execute one or more tasks autonomously and / or by remote control from a human operator.
**Student** - Anyone born after May 1, 2007 (i.e., who will be 15 or younger at VEX Worlds 2023). Eligibility may also be granted based on a disability that has delayed education by at least one year. Students are the individuals who design, build, repair, and program the Robot with minimal Adult assistance.

- **Elementary School Student** - Any Student born after May 1, 2010 (i.e., who will be 12 or younger at VEX Worlds 2023). Elementary School Students may “play up” and compete as a Middle School Student.

- **Middle School Student** - Any eligible Student who is not an Elementary School Student.

**Team** - Two or more Students make up a Team. A Team is classified as an Elementary School Team if all members are Elementary School Students. A Team is classified as a Middle School Team if any members are Middle School Students, or if the Team is made up of Elementary School Students who declare themselves as “Playing Up” as Middle School Students by registering their Team as a Middle School Team.

Once declared and playing as a Middle School Team, that Team may not change back to an Elementary School Team for the remainder of the season. Teams may be associated with schools, community/youth organizations, or a group of neighborhood Students.

- **Builder** - The Student(s) on the team who assemble(s) the Robot. An Adult cannot be a Builder on a Team. Adults are permitted to teach the Builder(s) associated concepts, but may never work on the Robot without the Builder(s) present and actively participating.

- **Designer** - The Student(s) on the Team who design(s) the Robot to be built for competition. An Adult cannot be a Designer on a Team. Adults are permitted to teach the Designer(s) associated concepts, but may never work on the design of the Robot without the Designer(s) present and actively participating.

- **Programmer** - The Student(s) on the Team who write(s) the computer code that is downloaded onto the Robot. An Adult cannot be a Programmer on a Team. Adults are permitted to teach the Programmer(s) associated concepts, but may never work on the code that goes on the Robot without the Programmer(s) present and actively participating.

**Violation** - The act of breaking a rule in the Game Manual.

- **Minor Violation** - A Violation which does not result in a Disqualification.
  - Accidental, momentary, or otherwise non-Score Affecting Violations are usually Minor Violations.
  - Minor Violations usually result in a verbal warning from the Head Referee during the Match, which should serve to inform the Team that a rule is being Violated before it escalates to a Major Violation.
• **Major Violation** - A *Violation* which results in a *Disqualification*.
  
  o Unless otherwise noted in a rule, all *Score Affecting Violations* are *Major Violations*.
  
  o If noted in the rule, egregious or intentional *Violations* may also be *Major Violations*.
  
  o Multiple *Minor Violations* within a *Match* or tournament may escalate to a *Major Violation*, at the Head Referee’s discretion.

• **Score Affecting** - A *Violation* which improves a Team’s or an Alliance’s score at the end of a *Match*.
  
  o Multiple *Violations* within a *Match* can cumulatively become *Score Affecting*.
  
  o When evaluating if a *Violation* was *Score Affecting*, Head Referees will focus primarily on any *Robot* actions that were directly related to the *Violation*.
  
  o Determining whether a *Violation* was *Score Affecting* can only be done once the *Match* is complete and the scores have been calculated.

Some rules include *Violation* Notes in a *red italicized text* to denote special circumstances or provide additional clarifications. If no *Violation* Notes are found in a given rule, then it should be assumed that the above “default” definitions apply.

To determine whether a *Violation* may have been *Score Affecting*, check whether the *Violation* directly contributed to increasing the score of the *Match*. If it did not increase the Alliance’s score, then the *Violation* was not *Score Affecting*, and it was very likely a *Minor Violation*.

See the following flowchart for more information.
Figure 4: The process for determining Violations in VIQC Slapshot.
Game-Specific Definitions

Contact Bonus - A point bonus achieved at the end of a Match. See <SC4> for more details.

Contact Zone - One of the regions of the Field, as shown in Figure 5, where Teams can receive the Contact Bonus.

- Contact Zones are bordered by the Field Perimeter, the Fence, and I or VEX IQ beams. These bordering elements are not considered part of their respective Contact Zones.
- Contact Zones are defined as the Floor itself; they are not infinitely vertical volumes.

Disc - An orange, plastic, roughly cylindrical object with the following approximate dimensions:

- Diameter: 2.5 Inches (63.5 mm)
- Height: 0.5 Inches (12.7 mm)
- Weight: 0.02 lbs (10 grams)

Note: Although they are similar, Discs used in VIQC Slapshot are not interchangeable with the “5x Pitch Weighted Disks” found in the VEX GO product line (228-7384) and used in the Factory Automation Competition.
Dispenser - A structure built out of VEX IQ parts which contains Discs at the beginning of the Match. Robots can interact with Dispensers to Remove Discs for points. There are five (5) Dispensers total:

- One yellow Dispenser, containing nine (9) Discs
- Two blue Dispensers, containing ten (10) Discs each
- Two purple Dispensers, containing eight (8) Discs each

Expansion Zone - One of the regions of the Floor, as shown in Figure 5, where Robots can expand horizontally beyond the 11” x 19” limit. See rule <G13>.

Fence - The gray PVC pipe, and all supporting structures built out of VEX IQ parts, which spans the entire width of the Field.

Fence Line - The black line on the Floor which runs immediately underneath and parallel to the Fence. The Fence Line borders the 2-Point Goal Zone, the Purple Contact Zones, and the purple VEX IQ parts bordering the Purple Contact Zones.

Goal Zone - One of the regions of the Field, as shown in Figure 9, in which Discs can earn points. Goal Zones are defined as infinitely vertical 3-dimensional projections of these regions of the Floor; they are not just the Floor itself.
**Removed** - A Disc status. A Disc is considered Removed from a Dispenser if it meets the following criteria:

- It is one of the 45 Discs which begin the Match in Dispensers
- It ends the Match having moved from its original position such that it is no longer fully supported by its Dispenser (i.e., its Dispenser has been “triggered” by a Robot).

See <SC5> for more details.

---

**Figure 10:** Four (4) Discs have been Removed from the Dispenser on the right.

---

**Scored** - A Disc status. See the Scoring section for more information.
Scoring

<table>
<thead>
<tr>
<th>Each Disc Scored in a Goal Zone</th>
<th>The point value corresponding to that Goal Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Disc Removed from a Dispenser</td>
<td>1 point</td>
</tr>
<tr>
<td>Each Robot that achieves the Contact Bonus</td>
<td>Additional 1 point per Disc that is Scored in the corresponding Goal Zone</td>
</tr>
</tbody>
</table>

<SC1> All Scoring statuses are evaluated immediately after the Match ends, once all Discs, Field Elements, and Robots on the Field come to rest.

- a. Referees and other event staff are not allowed to review any videos or pictures from the Match, per <T1b>.
- b. If there is a concern regarding the score of a Match, only the Drivers from that Match, not an Adult, may share their questions with the Head Referee.
- c. This rule’s intent is for Driver inputs and Robot motion to cease at the end of the Match. A pre-programmed routine which causes Robot motion to continue after the end of the Match would violate the spirit of this rule. Any Scoring which takes place after the Match due to Robots continuing to move will not count.

<SC2> Each Disc that is Scored in a Goal Zone is worth the point value corresponding to that Goal Zone. For example, all Discs which are Scored in the 3-Point Goal Zone are worth three (3) points each.

To be considered Scored, a Disc must meet the following criteria:

1. The Disc is not contacting a Robot.
2. The Disc is at least partially within a Goal Zone.
3. The Disc is not contacting a Contact Zone.

If a Disc meets all of the above criteria, and is partially within two Goal Zones, then it is considered Scored in the Goal Zone farthest from the Fence.

If a Disc is launched by a Robot after the Match has ended, it will be removed from the Field by the Head Referee, and not considered Scored. This is the only Disc that is affected; all other Discs will still be considered Scored, even if they were impacted by the post-Match Disc. See this Q&A for more information.
Disc Scoring examples, per the criteria listed in <SC2>. In these figures, each labeled Disc is highlighted to indicate which Goal Zone it is scored in.

<table>
<thead>
<tr>
<th>Disc</th>
<th>Score Value</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4 Points</td>
<td>• Fully within the 4-Point Goal Zone</td>
</tr>
</tbody>
</table>
| B    | 4 Points    | • Partially within the 4-Point Goal Zone  
• Resting on top of the border of the Contact Zone is irrelevant, because the Disc is not contacting the Contact Zone itself |
| C    | 0 Points    | • Contact with the Contact Zone overrides any other statuses |
| D    | 4 Points    | • Fully within the 4-Point Goal Zone  
• Contact with the black line is irrelevant, because the black line is still considered part of the 4-Point Goal Zone |
| E    | 1 Point     | • Partially within both the 4-Point and 1-Point Goal Zones (i.e., it has “broken the plane” and entered into the 1-Point Goal Zone)  
• The 1-Point Goal Zone is further from the Fence |
| F    | 1 Point     | • Partially within the 1-Point Goal Zone  
• Being fully supported by Disc G is not relevant; the Goal Zones are infinitely vertical volumes, so this Disc has “broken the plane” and entered the 1-Point Goal Zone |
| G    | 4 Points    | • Fully within the 4-Point Goal Zone  
• Contact with Disc F is not relevant |
Disc   | Score Value | Explanation                                      
-------|-------------|--------------------------------------------------
A      | 0 Points    | Not partially within any Goal Zone (i.e., it has not “broken the plane” and entered the 2-Point Goal Zone) 
B      | 2 Points    | Partially within the 2-Point Goal Zone

<SC4> A **Robot achieves a Contact Bonus** if any part of the Robot is contacting the Floor inside of a Contact Zone. The Contact Bonus is worth a number of points equal to the number of Discs which are Scored in the Contact Zone’s corresponding Goal Zone.

For example, if a Robot is contacting the Purple Contact Zone, and there are five (5) Discs Scored in the 2-Point Goal Zone, then that Robot receives a Contact Bonus of five (5) points.

*Note: If a single Robot is contacting the Floor in multiple Contact Zones, then it is not eligible for any Contact Bonuses.*

*Note 2: Contact Bonuses are awarded separately per Robot, and are added together.*

<SC5> Each **Disc that is Removed from a Dispenser** receives one point. The recommended way to determine how many Discs have been Removed is to look at how many Discs are in a given Dispenser at the end of a Match, and subtract it from the starting quantity for that Dispenser.

For example, if a purple Dispenser ends the Match with 2 Discs left, then it should be reasonably assumed that 6 Discs were Removed from it.

If a **Dispenser** is “triggered” by a Robot and a Disc incidentally lands in a position that partially meets the definition of Removed, Teams will generally be given the “benefit of the doubt”, and the Disc will be considered Removed. It will be at the Head Referee’s discretion whether this interaction was truly incidental (such as in Figure 14), or due to an “incomplete trigger” by the Robot (such as Figure 15).
Safety Rules

**<S1> Stay safe, don’t damage the Field.** If, at any time, the Robot operation or Team actions are deemed unsafe or have damaged any Field Elements or Discs, the offending Team may be Disabled and / or Disqualified at the Head Referee’s discretion. The Robot will require re-inspection before it may again take the Field.

**General Game Rules**

**<G1> Treat everyone with respect.** All Teams are expected to conduct themselves in a respectful and professional manner while competing in VEX IQ Competition events. If a Team or any of its members (Students or any Adults associated with the Team) are disrespectful or uncivil to event staff, volunteers, or fellow competitors, they may be Disqualified from a current or upcoming Match. Team conduct pertaining to <G1> may also impact a Team’s eligibility for judged awards. Repeated or extreme violations of <G1> could result in a Team being Disqualified from an entire event, depending on the severity of the situation.

This rule exists alongside the REC Foundation Code of Conduct. Violation of the Code of Conduct can be considered a Major Violation of <G1> and can result in Disqualification from a current Match, an upcoming Match, an entire event, or (in extreme cases) an entire competition season. The Code of Conduct can be found at [https://kb.roboticseducation.org/hc/en-us/articles/4416850656535-Code-of-Conduct-for-VIQC](https://kb.roboticseducation.org/hc/en-us/articles/4416850656535-Code-of-Conduct-for-VIQC).

Violation Notes: Violations of <G1> may be considered Major Violations, and should be addressed on a case-by-case basis. Teams at risk of a Major <G1> Violation due to multiple Minor Violations for disrespectful or uncivil behaviors will usually receive a “final warning,” although the Head Referee is not required to provide one.
VEX IQ is a student-centered program. Adults may assist Students in urgent situations, but Adults may never work on or program a Robot without Students on that Team being present and actively participating. Students must be prepared to demonstrate an active understanding of their Robot construction and programming to judges or event staff.

Some amount of Adult mentorship, teaching, and / or guidance is an expected and encouraged facet of VEX competitions. No one is born an expert in robotics! However, obstacles should always be viewed as teaching opportunities, not tasks for an Adult to solve without Students present and actively participating.

When a mechanism falls off, it is...
...Okay for an Adult to help a Student investigate why it failed, so it can be improved.
...Not okay for an Adult to put the Robot back together.

When a Team encounters a complex programming concept, it is...
...Okay for an Adult to guide a Student through a flowchart to understand its logic.
...Not okay for an Adult to write a pre-made command for that Student to copy / paste.

During Match play, it is...
...Okay for an Adult to provide cheerful, positive encouragement as a spectator.
...Not okay for an Adult to explicitly shout step-by-step commands from the audience.

This rule operates in tandem with the REC Foundation Student Centered Policy, which is available on the REC Foundation website for Teams to reference throughout the season: https://kb.roboticseducation.org/hc/en-us/articles/4421127318423-Student-Centered-Policy-for-VIQC.

Violation Notes: Potential Violations of this rule will be reviewed on a case-by-case basis. By definition, all Violations of this rule become Score Affecting as soon as it is determined that a Robot which was built by an Adult has won a Match.

Use common sense. When reading and applying the rules in this document, please remember that common sense always applies in the VEX IQ Competition.

Some examples may include:

- If there is an obvious typographical error (such as “per <T5>” instead of “per <G5>”), this does not mean that the error should be taken literally until corrected in a future update.
- Understand the realities of the VEX IQ Robot construction system. For example, if a Robot could hover above the Field for a whole Match, that would create loopholes in many of the rules. But ... they can’t. So ... don’t worry about it.
- When in doubt, if there is no rule prohibiting an action it is generally legal. However, if you have to ask whether a given action would violate <S1>, <G1>, or <T1>, then that’s probably a good indication that it is outside the spirit of the competition.
- In general, Teams will be given the “benefit of the doubt” in the case of accidental or edge-case rules infractions. However, there is a limit to this allowance, and repeated or strategic infractions will still be penalized. See <SC1c> as an example.
The Robot must represent the skill level of the Team. Each Team must include Drivers, Programmer(s), Designer(s), and Builder(s). No Student may fulfill any of these roles for more than one VEX IQ Competition Team in a given competition season. Students may have more than one role on the Team, (e.g., a Designer may also be a Builder, a Programmer, and a Driver).

a. Team members may move from one Team to another for non-strategic reasons that are outside of the Team’s control.

i. Examples of permissible moves may include, but are not limited to, illness, changing schools, conflicts within a Team, or combining / splitting Teams.

ii. Examples of strategic moves in violation of this rule may include, but are not limited to, one Programmer “switching” Teams in order to write the same program for multiple Robots, or one Student writing the Engineering Notebook for multiple Teams.

iii. If a Student leaves a Team to join another Team, <G4> still applies to the Students remaining on the previous Team. For example, if a Programmer leaves a Team, then that Team’s Robot must still represent the skill level of the Team without that Programmer. One way to accomplish this would be to ensure that the Programmer teaches or trains a “replacement” Programmer in their absence.

b. When a Team qualifies for a Championship event (e.g., States, Nationals, Worlds, etc.) the Students on the Team attending the Championship event are expected to be the same Students on the Team who were awarded the spot. Students can be added as support to the Team, but may not be added as Drivers or Programmers for the Team.

i. An exception is allowed if one (1) Driver and / or one (1) Programmer on the Team cannot attend the event. The Team can make a single substitution of a Driver or Programmer for the Championship event with another Student, even if that Student has competed on a different Team. This Student will now be on this new Team and may not return to the original Team.

c. Within a single event, a Driver may only drive for one (1) Team. If a Team attends an event with only one (1) Driver in attendance, then that Team is granted an allowance to use another qualified Driver from the event. This substitute Driver is given an exemption for this event and may only Drive for this one Team at that event. Once the event is over, the substitute Driver will go back to his or her original Team. This exception is only granted if a Team has one (1) Driver in attendance due to reasons outside of the Team control, such as illness.

Violation Notes: Violations of this rule will be evaluated on a case-by-case basis, in tandem with the REC Foundation Student Centered Policy as noted in <G2>, and the REC Foundation Code of Conduct as noted in <G1>.

Event Partners should bear in mind <G3>, and use common sense when enforcing this rule. It is not the intent to punish a Team who may change Team members over the course of a season due to illness, changing schools, conflicts within a Team, etc.

Event Partners and referees are not expected to keep a roster of any Student who has ever been a Driver for one day. This rule is intended to block any instance of loaning or sharing Team members for the sole purpose of gaining a competitive advantage.
Pre-match setup. At the beginning of a Match, each Robot must meet the following criteria:

1. Not contacting any Discs, other Field Elements, or other Robots.
2. Fit within an 11" x 19" x 15" (279mm x 483mm x 381mm) volume, as checked during inspection per <R5>.
3. Contacting the inner wall of the Field Perimeter that is furthest from the Fence. See the green highlight on Figure 16.

Violation Notes: Any Violations of this rule will result in the Robot being removed from the Field prior to the start of the Match; rules <R3d> and <T17> will apply until the situation is corrected. The Team will not receive a Disqualification, but they will not be permitted to play in the Match.

Note: There are no specific starting positions, as long as the above criteria are met. Head Referees may ask Teams to temporarily move their Robot between two of the black lines on the field for a size check, but there is no requirement for them to start the Match in that location once the size has been verified.

Drivers switch controllers midway through the Match.

a. In a given Match, only two (2) Drivers may be in the Driver Station per Team. No Driver shall operate a Robot for more than thirty-five seconds (0:35). The two Drivers must switch their controller between thirty-five seconds (0:35) and twenty-five seconds (0:25) remaining in the Match. The second Driver may not touch their Team’s controls until the controller is passed to them. Once the controller is passed, the first Driver may no longer touch their Team’s controls.

b. Drivers are the only Team members that are allowed to be in the Driver Station. No Adults are permitted in the Driver Station.

Note: If only one Driver is present (i.e., the Team has not exercised the allowance in <G4>), this rule still applies, and they must cease Robot operation after the first thirty-five (0:35) seconds of the Match.
Violation Notes: At a minimum, any Violation of this rule is considered a Minor Violation. Whether it escalates to a Major Violation or not is dependent upon the Head Referee judgment regarding:

- Prior warnings or Violations
- Any Score Affecting actions that were a direct result of the Violation, such as the first Driver scoring additional points after 35 seconds of driving

<G7> Drivers drive your Robot, and stay in the Driver Station. During a Match, Robots may only be operated by that Team’s Drivers and / or software running on the Robot control system. Drivers must remain in their Driver Station, except when legally interacting with their Robot as per <G12>.

Drivers are prohibited from any of the following actions during a Match:

a. Bringing / using any sort of communication device into the Driver Station. Devices with communication features turned off (e.g., phones in airplane mode) are allowed.

b. Standing or sitting on any sort of object during a Match, regardless of whether the Field is on the floor or elevated.

c. Materials used outside of the 1:00 Match time are permitted, provided that no other rules are violated. Examples could include a bin to help carry the Robot to the Field, or VEX IQ parts used to help align the Robot at the start of the Match.

Note: Drivers are the only Team members that are allowed to be in the Driver Station during a Match.

Violation Notes: Major Violations of this rule are not required to be Score Affecting, and could invoke Violations of other rules, such as <G1>, <G2>, or <G6>.

<G8> Hands out of the Field. Drivers are prohibited from making intentional contact with any Field Element, Disc, or Robot during a Match, except for the allowances in <G12> and / or <RSC5>.

<G9> Keep Discs in the Field. Discs that leave the Field during a Match will not be returned. “Leaving the Field” means that a Disc is outside of the Field Perimeter and no longer in contact with the Field, Field Element, other Discs, or Robots.

If a Disc is on its way out of the Field (as determined by the Head Referee), but is deflected back into the field by a Driver, field monitor, ceiling / wall, or other external factor, <G9> would still apply. This Disc should be considered “out of the field” and removed by the Head Referee. If the redirection occurred due to contact with a Driver, it will be at the Head Referee’s discretion whether <G8> or <G9> should apply.
**<G10> Keep your Robot together.** Robots may not intentionally detach parts or leave mechanisms on the Field during any Match. Parts that become unintentionally detached from the Robot are no longer considered to be part of the Robot and can be either left on the Field or collected by a Driver (utilizing <G12>).

**<G11> Don’t damage the Field.** Robot interactions which damage the Field or any Field Element are prohibited. For the purpose of this rule, “damage” is defined as anything which requires repair in order to begin the next Match.

Specific examples include, but are not limited to:

- A Dispenser detaching from the Floor
- VEX IQ parts detaching from a Dispenser structure
- The PVC pipe detaching from the Fence

*Note: The purple Dispenser is designed to spin counter-clockwise. Intentionally attempting to rotate the purple Dispenser mechanism in the wrong direction (clockwise) creates a significant risk of Field Element damage, and is strictly prohibited.*

*Teams* are responsible for the actions of their Robot at all times, especially when interacting with Dispenser. If a Team chooses to repeatedly ram full-speed into a Dispenser, it will be hard to convince a Head Referee that any damage caused was “accidental.”

Violation Notes: In most cases, Field damage is accidental and does not impact the final score, and should therefore only be considered a Minor Violation / formal warning.

However, any Field damage which results in Discs becoming Removed is inherently Score Affecting. Therefore, if the Head Referee determines that this damage was accidental they may choose to issue a Match Replay, per <T19>, in lieu of a Major Violation.

**Egregious, intentional, or repeated accidental / Minor Violations may escalate to a Major Violation at the Head Referee’s discretion.**
<G12> **Handling the Robot mid-match is allowed under certain circumstances.** If a *Robot* goes completely outside the playing *Field*, gets stuck, tips over, or otherwise requires assistance, the *Team’s Driver* may retrieve & reset the *Robot*. To do so, they must:

1. Signal the *Head Referee* by placing their VEX IQ Controller on the ground.
2. Any *Disc* being controlled by the *Robot* while being handled must be removed from the *Field*.
   a. In the context of this rule, “controlled” implies that the *Robot* was manipulating the *Disc*, and not simply touching it. For example, if the *Disc* moves with the *Robot* either vertically or while turning, then the *Robot* is “controlling” the *Disc*.
3. The *Robot* must be placed back into a legal position that meets the criteria listed in <G5> (i.e., contacting the *Field Perimeter*, not contacting any *Discs*, etc.).

If the *Driver* cannot reach a *Robot* in the center of the *Field*, they may ask the *Head Referee* to pick up the *Robot* and hand it to the *Driver* for placement according to the conditions above.

*Violation Notes: This rule is intended to allow Teams to fix damaged Robots or help get their Robot “out of trouble.” Strategically exploiting this rule may be considered a Minor Violation or Major Violation, at the Head Referee’s discretion.*

<G13> **Horizontal expansion is limited during a Match.** *Robots* may only expand horizontally beyond the 11” x 19” starting dimension limit if they are contacting the *Expansion Zone*.

*Note: There are no restrictions on vertical expansion.*

<G14> **Don’t cross the Fence Line until Contact.** *Robots* may only extend over the *Fence Line* and “break the plane” of the 3-dimensional area of the 2-Point *Goal Zone* if they are contacting the *Expansion Zone*.

*Figure 17: A top-down view of the Fence Line, demonstrating various Disc and Robot states. The Expansion Zone is highlighted.*
In Figure 17,

- Robot A is legally crossing the Fence Line into the 2-Point Goal Zone, because it is in contact with an Expansion Zone.
- Robot B may intend to cross the Fence Line and extend into the 2-Point Goal Zone, and would receive a formal violation if it extended into the 2-Point Goal Zone.
- Robot C has fully “broken the plane” of the 2-Point Goal Zone, and is not contacting an Expansion Zone, and is therefore in violation of this rule.

Contact with the Fence and / or Fence Line, including interaction with partially-crossed Discs such as G or H in Figure 17, is expected in standard gameplay. However, strategies or mechanisms which rely solely on this type of interaction may receive additional scrutiny from Head Referees. Team should be prepared to demonstrate that these mechanisms include design features which prevent them from crossing the Fence Line.

Discs that have crossed the Fence Line are “off limits”. Robots may not contact any Discs which have fully crossed the Fence Line, regardless of whether the Robot is contacting an Expansion Zone or not.

For example, in Figure 17:

- Discs D, E, and F would be considered “not safe” to contact, because they have fully crossed the Fence Line.
- Discs G and H would be considered “safe” to contact, because they have only partially crossed the Fence Line. Of course, rules <G14> and <G16> still apply.

Note: This rule is not transitive through Discs. For example, if Robot B pushed Disc H into Disc F without “breaking the plane” of the 2-Point Goal Zone, this would not be considered a violation.

Violation Notes: The intent of rules <G14> and <G15> are to prevent Robots from interacting with Discs which have already crossed the Fence Line. All examples below refer to Figure 17.

The following examples would be considered Minor Violations:

- Contacting a Disc while legally expanding, such that the Disc does not change its point value; for example, Robot A contacting Disc D in the figure above without pushing it into a Goal Zone.
- Robot A pushing Disc E off the border and into the 2-Point Goal Zone; because Disc E is resting on the border of the Contact Zone but not touching the Contact Zone, it is already Scored and the interaction will not change its point value.

The following examples would be considered Score Affecting, and therefore Major Violations:

- Robot B or C pushing Disc F from the 2-Point Goal Zone into the 3-Point Goal Zone.
- A mechanism which reaches past the Fence while launching a Disc (e.g., Robot C in the figure above).
<G16> Discs go under the Fence, not over it. Discs may only be Scored in Goal Zone by passing them underneath the gray PVC pipe. Robot actions such as “dumping,” “placing,” or “throwing” Discs over the Fence are strictly prohibited, and will result in a Disqualification.

Note: Discs which incidentally bounce over the Fence upon being Removed from a Dispenser are not considered a violation of this rule.

Please don’t over-think this rule.

There are no restrictions on what type of Robot action, mechanism, strategy, or technique is used to get the Disc under the Fence and into the Goal Zone. If it passes between the gray PVC pipe and the Floor, and doesn’t break any other rules, it’s probably legal.

There are no legal ways to get Discs into Goal Zones without passing between the gray PVC pipe and the Floor. If you think you have found one, it will probably be made illegal in a future Game Manual update.

Violation Notes: Since this rule is inherently Score Affecting, all Violations will be considered Major Violations.
Section 2
The Robot

Description

Every Robot must pass a full inspection before being cleared to participate in Matches. This inspection will ensure that all Robot rules and regulations are met. Initial inspections will typically take place during team registration/practice time. Every Team should use the rules below as a guide to pre-inspect their Robot and ensure that it meets all requirements.

Inspection Rules

<R1> One Robot per Team. Only one (1) Robot will be allowed to participate per Team at a given event. Though it is expected that Teams will make changes to their Robots at the event, a Team is limited to only one (1) Robot during a given event, and a given Robot may only be used by (1) Team. The VEX IQ system is intended to be a mobile robotics design platform. As such, a VEX IQ Competition Robot, for the purposes of the VEX IQ Competition, has the following subsystems:

- Subsystem 1: Mobile robotic base including wheels, tracks, or any other mechanism that allows the Robot to navigate the majority of the flat playing Field surface. For a stationary Robot, the robotic base without wheels would be considered Subsystem 1.
- Subsystem 2: Power and control system that includes a VEX IQ legal battery, a VEX IQ control system, and associated VEX IQ Smart Motors for the mobile robotic base.
- Subsystem 3: Additional mechanisms (and associated VEX IQ Smart Motors) that allow manipulation of Discs or manipulation of Field obstacles.

Given the above definitions, a minimum Robot for use in any VEX IQ Competition event (including Skills Challenges) must consist of subsystems 1 and 2 above. Thus, if you are swapping out an entire subsystem of either item 1 or 2, you have now created a second Robot and have violated this rule.

a. Teams may not compete with one Robot while a second is being modified or assembled at the event.

b. Teams may not have an assembled second Robot on-hand that is used to repair or swap parts with the first Robot.

c. Teams may not switch back and forth between multiple Robots during a competition. This includes using different Robots for Skills Challenges, Qualification Matches and/or Finals Matches.

d. Multiple Teams may not use the same Robot. Once a Robot has competed under a given Team number at an event, it is “their” Robot — no other Teams may compete with it for the duration of the competition season.
The intent of <R1a>, <R1b>, and <R1c> is to ensure an unambiguous level playing field for all Teams. Teams are welcome (and encouraged) to improve or modify their Robots between events, or to collaborate with other Teams to develop the best possible game solution.

However, a Team who brings and/or competes with two separate Robots at the same tournament has diminished the efforts of a Team who spent extra design time making sure that their one Robot can accomplish all of the game's tasks. A multi-Team organization that shares a single Robot has diminished the efforts of a multi-Team organization that puts in the time, effort, and resources to undergo separate individual design processes and develop their own Robots.

To help determine if a robot is a “separate Robot” or not, use the subsystem definitions found in <R1>. Above that, use common sense as referenced in <G3>. If you can place two complete and legal Robots on a table next to each other, then they are two separate Robots. Trying to decide if changing a pin, a wheel, or a motor constitutes a separate robot is missing the intent and spirit of this rule.

**<R2> Robots must represent the Team’s skill level.** The Robot must be designed, built, and programmed by members of the Team. Adults are permitted to mentor and teach design, building, and programming skills to the Students on the Team, but may not design, build, or program that Team’s Robot.

In VIQC, we expect Adults to teach fundamental Robot principles like linkages, drivetrains, and manipulators, then allow the Students to determine which designs to implement and build on their Robot.

Similarly, Adults are encouraged to teach the Students how to code various functions involving applicable sensors, then have the Students program the Robot from what they have learned.

**<R3> Robots must pass inspection.** The Team’s Robot must pass inspection before being allowed to participate in any Matches. Noncompliance with any Robot design or construction rule will result in Disqualification of the Robot at an event until the Robot is brought back into compliance.

a. Significant changes to a Robot, such as a partial or full swap of Subsystem 3, must be re-inspected before the Robot may compete again.

b. All possible functional Robot configurations must be inspected before being used in competition.

c. Teams may be requested to submit to random spot-inspections by Head Referees. Refusal to submit will result in Disqualification.

i. If a Robot is determined to be in violation of a Robot rule before a Match begins, the Robot will be removed from the Field. A Driver may remain at the Field so that the Team does not get assessed a “no-show” (per <T11>).
d. **Robots** which have not passed inspection (i.e., that may be in violation of one or more **Robot** rules) will not be permitted to play in any **Matches** until they have done so. &lt;T11&gt; will apply to any **Matches** that occur until the **Robot** has passed inspection.

e. If a **Robot** has passed inspection, but is later found to be in violation of a **Robot** rule during a **Match**, then they will be Disqualified from that **Match** and &lt;R3d&gt; / &lt;T11&gt; will apply until the violation is remedied and the **Team** is re-inspected.

f. All Inspection Rules are to be enforced within the discretion of the **Head Referee** within a given event. **Robot** legality at one event does not automatically imply legality at future events. **Robots** which rely on “edge-case” interpretations of subjective rules, such as whether a decoration is “non-functional” or not, should expect additional scrutiny during inspection.

**&lt;R4&gt; Officially registered Team numbers must be displayed on Robot License Plates.** To participate in an official VEX IQ Competition Event, a **Team** must first register on robotevents.com and receive a VEX IQ Competition **Team** Number.

This **Team** number must be displayed on at least one (1) VEX IQ Competition **License Plate**. **Teams** may choose to use the official VEX IQ Competition **License Plate** (VEX Part Number 228-7401), or may create their own custom **License Plates**.

1. **License Plates** must fulfill all Inspection rules.

2. **License Plates** must be clearly visible at all times. For example, a **License Plate** must not be in a position that would be easily obstructed by a **Robot** mechanism during standard **Match** play.

3. Any custom-made **License Plates** used must be the same length and height as the official **License Plate** (3.5” x 1.5” [88.9mm x 38.1mm]). They must not exceed the width of the official **License Plate** (0.25” [6.35mm]).

4. Custom-made **License Plates** are considered non-functional decorations, and must therefore meet all of the criteria listed in &lt;R8&gt;. Therefore, 3D printed **License Plates** are permitted within these rules.
Starting configuration. At the start of each Match, the Robot must be able to satisfy the following constraints:

a. Only be contacting the Floor and/or the Field Perimeter
b. Fit within an 11” x 19” x 15” (279.4mm x 482.6mm x 381.0mm) volume

The Match configuration will be inspected. The Robot must be inspected in a configuration that will be used for pre-Match setup as described in <G5> and within the maximum allowed starting size.

a. Teams using more than one Robot configuration at the beginning of Matches must tell the Inspector(s) and have the Robot inspected in its largest configuration(s).

b. A Team may NOT have its Robot inspected in one configuration and then place it in an uninspected configuration at the start of a Match.

VEX IQ product line. Robots may be built ONLY from Official Robot Components from the VEX IQ product line, unless otherwise specifically noted within these rules.

a. Official VEX IQ products are ONLY available from VEX Robotics. To determine whether a product is “official” or not, consult www.vexiq.com.

b. If an Inspector or event official questions whether something is an official VEX IQ component, the Team will be required to provide documentation to an Inspector that proves the component’s source. Such documentation may include receipts, part numbers, or other printed documentation.

c. Only VEX IQ components specifically designed for use in Robot construction are allowed. Using additional components outside their typical purpose is against the intent of the rule (i.e., please don’t try using VEX IQ apparel, team or event support materials, packaging, Field Elements, or other non-Robot products on a VEX IQ Competition Robot).
d. Products from the VEX V5, VEX EXP, Cortex, or VEXpro product lines cannot be used for Robot construction. However, products from the VEX V5 product line that are also cross-listed as part of the VEX IQ product line are legal. A “cross-listed” product is one which can be found in both the VEX IQ and VEX V5 sections of the VEX Robotics website.

e. Mechanical / structural components from the VEX Robotics by HEXBUG product line are legal for Robot construction. However, electrical components from the VEX Robotics by HEXBUG product line are illegal for Robot construction.

f. Mechanical / structural components from the VEX GO product line are legal for Robot construction. However, electrical components from the VEX GO product line are illegal for Robot construction.

g. Official Robotics Components from the VEX IQ product line that have been discontinued are still legal for Robot use. However, Teams must be aware of <R7b>.

h. Functional 3D printed components, such as replicas of legal VEX IQ parts or custom designs, are not legal for Robot use.

i. Additional VEX IQ products that are released during the season are legal for use, unless otherwise noted on their product pages and / or the VEX IQ Competition Legal Parts Appendix.

Note: A comprehensive list of legal parts can be found in the VEX IQ Competition Legal Parts Appendix, at https://www.vexrobotics.com/iq/competition/viqc-current-game. This Appendix is updated as needed if / when new VEX IQ parts are released, and may not coincide with scheduled Game Manual updates.

<R8> Non-VEX IQ components. Robots are allowed to use the following additional “non-VEX IQ” components:

a. Appropriate non-functional decorations, provided that these do not affect the Robot performance in any significant way or affect the score of the Match. Inspectors and Head Referees will have the final say in what is considered “non-functional.”

b. Decorations must be in the spirit of an educational competition.

c. To be considered “non-functional,” any decorations must be backed by legal materials that provide the same functionality. For example, a giant decal cannot be used to prevent Discs from falling out of the Robot unless it is backed by VEX IQ material. A simple way to check this is to determine if removing the decoration would impact the performance of the Robot in any way.

d. The use of non-toxic paint is considered a legal non-functional decoration. However, any paint being used as an adhesive or to impact how tightly parts fit together would be classified as functional.

e. Rubber bands that are identical in length and thickness to those included in the VEX IQ product line (#32, #64 & #117B).

f. ⅛” metal shafts from the VEX V5 product line.

Teams should be mindful of any non-functional decorations which could risk “distracting” sensors on Alliance partner Robots, such as the Vision Sensor.
<R9> **Microcontroller.** *Robots* are limited to ONE (1) VEX IQ Robot Brain.

a. Robot Brains, microcontrollers, and other electronic components that are part of the VEX Robotics by HEXBUG, VEX GO, VEX EXP, VEX V5, VEX 123, or VEXpro product lines are not allowed.

i. The Robot AA Battery Holder (228-3493) is the only exception to this rule, per <R12>.

b. If using a first generation VEX IQ Brain, *Robots* must use one (1) VEX IQ 900 MHz radio, VEX IQ 2.4 GHz radio, or VEX IQ Smart Radio in conjunction with their VEX IQ Robot Brain.

c. The only legal method of driving the *Robot* during Teamwork *Matches* and Driving Skills *Matches* is the VEX IQ Controller.

d. See <RSC5> and <RSC6> for more information about operating the *Robot* during Programming Skills *Matches*.

<R10> **Motors.** *Robots* may use up to six (6) VEX IQ Smart Motors.

a. Additional motors cannot be used on the *Robot* (even motors that aren’t connected).

<R11> **Batteries.** The only allowable sources of electrical power for a VEX IQ Competition *Robot* are either one (1) VEX IQ Robot Battery (first or second generation) or six (6) AA batteries via the Robot AA Battery Holder (228-3493).

a. Additional batteries cannot be used on the *Robot* (even batteries that aren’t connected).

b. *Teams* are permitted to have an external power source (such as a rechargeable battery pack) plugged into their VEX IQ Controller during a *Match*, provided that this power source is connected safely and does not violate any other rules (such as <G6>).

*Note: Although it is legal, the Robot AA Battery Holder (228-3493) is not recommended for use in the VEX IQ Competition.*

<R12> **Firmware.** *Teams* must have their VEX IQ firmware (VEXos) up to date. *Teams* can download the latest version of VEXos at [www.vexiq.com/vexos](http://www.vexiq.com/vexos).

<R13> **Modifications of parts.** Parts may NOT be modified. Examples of modifications include, but are not limited to, bending, cutting, sanding, gluing, or melting.

a. Cutting metal VEX IQ or VEX V5 shafts to custom lengths is permitted.

b. It is legal to bend parts which are intended to be flexible, such as string, rubber bands, or thin plastic sheets.
Prohibited items. The following types of mechanisms and components are NOT allowed:

a. Those that could potentially damage Field Elements or Discs
b. Those that could potentially damage or entangle other Robots

Let it go after the Match is over. Robots must be designed to permit easy removal of Discs from the Robot without requiring that the Robot have power or remote control after the Match is over.
Section 3
The Tournament

Description

The VEX IQ Competition encompasses both the Teamwork Challenge and the Robot Skills Challenge. This section determines how the Teamwork Challenge and Robot Skills Challenge are to be played at a given event.

Awards may be given to top Teams in each format, as applicable. Awards may also be given for overall performance in the judged criteria. Please review the Awards Knowledge Base article for more details.

Tournament Definitions

Event Partner - The volunteer VEX IQ Competition tournament coordinator who serves as an overall manager for the volunteers, venue, event materials, and all other event considerations. Event Partners serve as the official liaison between the REC Foundation, other event volunteers, and event attendees.

Finals Match - A Teamwork Match used to determine the Teamwork Challenge champions.

Head Referee - An impartial volunteer responsible for enforcing the rules in this manual as written. Head Referees are the only people who may discuss ruling interpretations or scoring questions with Teams at an event.

Match Stop Time - The time remaining (i.e., displayed on the timer or audience display) in a tiebreaker Finals Match (see <T13b>) when an Alliance ends the Match early by placing their controllers on the ground. The Match Stop Time is rounded down to the nearest even number. For example, if controllers are set down when the displayed time is 13 seconds, the Match Stop Time is recorded as 12 seconds. If an Alliance does not finish the Match early, they receive a default Match Stop Time of 0 seconds.

Practice Match - A non-scored Match used to provide time for Teams to get acquainted with the official playing Field and procedures.

Qualification Match - A Teamwork Challenge Match used to determine the event rankings.

Robot Skills Challenge - A portion of the VEX IQ Competition. The Robot Skills Challenge consists of Driving Skills Matches and Programming Skills Matches as described in the General Definitions.

Scorekeeper Referee - An impartial volunteer responsible for tallying scores at the end of a Match. Scorekeeper Referees do not make ruling interpretations, and should redirect any Team questions regarding rules or scores to the Head Referee.

Teamwork Challenge - A portion of the VEX IQ Competition. The Teamwork Challenge consists of Teamwork Matches as described in the General Definitions. The Teamwork Challenge includes Qualification Matches and Finals Matches, and may include Practice Matches.
Tournament Rules

The Head Referee has ultimate and final authority on all gameplay ruling decisions during the competition.

a. Scorekeeper Referees score the Match, and may serve as observers or advisers for the Head Referees, but may not determine any rules or infractions directly.

b. When issuing a Disqualification or warning to a Team, The Head Referee must provide the rule number of the specific rule that has been Violated.

c. Violations of the REC Foundation Code of Conduct may involve additional escalation beyond the Head Referee’s initial ruling, including (but not limited to) investigation by an REC Foundation representative. Rules <S1>, <G1>, and <G2> are the only rules for which this escalation may be required.

d. Event Partners may not overrule a Head Referee’s decision.

Note from the VEX GDC: The rules contained in this Game Manual are written to be enforced by human Head Referees. Many rules have “black-and-white” criteria that can be easily checked. However, some rulings will rely on a judgment call from this human Head Referee. In these cases, Head Referees will make their calls based on what they and the Scorekeeping Referees saw, what guidance is provided by their official support materials (the Game Manual and the Q&A), and most crucially, the context of the Match in question.

The VEX IQ Competition does not have video replay, our fields do not have absolute sensors to count scores, and most events do not have the resources for an extensive review conference between each Match.

When an ambiguous rule results in a controversial call, there is a natural instinct to wonder what the “right” ruling “should have been,” or what the GDC “would have ruled.” This is ultimately an irrelevant question; our answer is that when a rule specifies “Head Referee’s discretion” (or similar), then the “right” call is the one made by the Head Referee in the moment. The VEX GDC designs games, and writes rules, with this expectation (constraint) in mind.

Head Referees must be qualified. Head Referees must have the following qualifications:

a. Be at least 16 years of age.

b. Be approved by the Event Partner.

c. Be an REC Foundation Certified VIQC Head Referee for the current season. (Certifications are expected to be released in Summer 2022)

Note: Scorekeeper Referees must be at least 15 years of age, and must be approved by the Event Partner.
Head Referees should demonstrate the following attributes:

- Thorough knowledge of the current game and rules of play
- Effective decision-making skills
- Attention to detail
- Ability to work effectively as a member of a team
- Ability to be confident and assertive when necessary
- Strong communication and diplomacy skills

<T3> The Drive Team is permitted to immediately appeal the Head Referee’s ruling. If Drivers wish to dispute a score or ruling, they must stay in the Driver Station until the Head Referee talks with them. The Head Referee may choose to meet with the Drivers at another location and/or at a later time so that the Head Referee has time to reference materials or resources to help with the decision. Once the Head Referee announces that their decision has been made final, the issue is over and no more appeals may be made (See rule <T1>).

a. Head Referees may not review any photo or video Match recordings when determining a score or ruling.

b. Head Referees are the only individuals permitted to explain a rule, Disqualification or warning to the Teams. Teams should never consult other field personnel, including Scorekeeper Referees, regarding a ruling clarification.

Communication and conflict resolution skills are an important life skill for Students to practice and learn. In VEX IQ Competitions, we expect Students to practice proper conflict resolution using the proper chain of command. Violations of this rule may be considered a Violation of <G1> and/or the Code of Conduct.

Some events may choose to utilize a “question box” or other designated location for discussions with Head Referees. Offering a “question box” is within the discretion of the Event Partner and/or Head Referee, and may act as an alternate option for asking Drivers to remain in the Driver Station (although all other aspects of this rule apply).

However, by using this alternate location, Drivers acknowledge that they are forfeiting the opportunity to use any contextual information involving the specific state of the field at the end of the Match. For example, it is impossible to appeal whether a game element was Scored or not if the field has already been reset. If this information is pertinent to the appeal, Drivers should still remain in the Driver Station, and relocate to the “question box” once the Head Referee has been made aware of the concern and/or any relevant context.
<T4> **Teamwork Matches.** During Teamwork Matches, two (2) Teams form an Alliance that will play on the Field.

a. Qualification Match Alliances are randomly selected.
b. Finals Match Alliances are assigned as follows:
   i. The first and second ranked Teams form an Alliance
   ii. The third and fourth ranked Teams form an Alliance
   iii. And so on, until all Teams participating in Finals Matches have formed an Alliance.

<T5> **Timeouts.** There are no timeouts in VEX IQ Qualification Matches or Finals Matches.

<T6> **Ending a Match early.** If an Alliance wants to end a Qualification Match or a Finals Match early, both Teams must signal the referee by ceasing all Robot motion and placing their controllers on the ground. The Head Referee will then signal to the Teams that the Match is over and will begin to tally the score. If the Match is a tiebreaker Finals Match (see <T14b>), then the Match Stop Time will also be recorded.

<T7> **Practice Matches may be played at some events, but are not required.** If Practice Matches are run, every effort will be made to equalize practice time for all Teams.

<T8> **Qualification Matches will occur according to the official Match schedule.** This schedule will indicate Alliance partners, Qualification Match times, and, if the event has multiple Fields, which Field each Qualification Match will be played on.

Note: The official Match schedule is subject to change at the Event Partner’s discretion.

<T9> **Each Team will be scheduled Qualification Matches as follows:**

a. When in a tournament, the tournament must have a minimum of four (4) Qualification Matches per Team. The suggested number of Qualification Matches per Team for a standard tournament is six (6), and is up to ten (10) for a championship event.

b. When in a league, there must be at least three (3) league ranking sessions and each session must include a minimum of two (2) Qualification Matches per Team. The suggested number of Qualification Matches per Team for a standard league ranking session is four (4). Event Partners may also choose to have Qualification Matches as part of their league finals session.
Teams are ranked by their average Qualification Match scores.

- **a.** When in a tournament, every Team will be ranked based on the same number of Qualification Matches.
  
  - **i.** For tournaments that have more than one (1) division, Teams will be ranked among all Teams in the event, (i.e., there is no divisional ranking). The top Teams, regardless of division, will advance to the Finals Matches.

- **b.** When in a league, every Team will be ranked based on the number of Matches played. Teams that participate in less than 60% of the total Matches available will be ranked below Teams that participate in at least 60% of the total Matches available, (e.g., if the league offers 3 ranking sessions with 4 Qualification Matches per Team, Teams that participate in 8 or more Matches will be ranked higher than Teams who participate in 7 or fewer Matches). Being a no-show to a Match that a Team is scheduled in still constitutes participation for these calculations.

- **c.** A specific number of a Team’s lowest Qualification Match scores will be excluded from the rankings, based on the number of Qualification Matches each Team plays. Excluded scores do not affect participation for leagues.

<table>
<thead>
<tr>
<th>Number of Qualification Matches Per Team</th>
<th>Number of Excluded Match Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four (4) to seven (7)</td>
<td>1</td>
</tr>
<tr>
<td>Eight (8) to eleven (11)</td>
<td>2</td>
</tr>
<tr>
<td>Twelve (12) to fifteen (15)</td>
<td>3</td>
</tr>
<tr>
<td>Sixteen (16) or more</td>
<td>4</td>
</tr>
</tbody>
</table>

- **d.** In some cases, a Team will be asked to play an additional Qualification Match. The extra Match will be identified on the Match Schedule with an asterisk and will not impact the Team’s ranking (or participation for leagues). Teams are reminded that <G1> is always in effect and Teams are expected to behave as if the additional Qualification Match impacts their rating.

- **e.** Ties in Team ranking are broken by:
  
  - **i.** Removing the Team’s lowest score and comparing the new average score.
  
  - **ii.** Removing the Team’s next-lowest score and comparing the new average score (and so on through all scores).
  
  - **iii.** If the Teams are still tied, the Teams will be sorted by random electronic draw.

**Be at your match on time.** If no member of a Team is present in the Driver Station at the start of a Driver Station, that Team is considered a “no show” and will receive zero (0) points. The other Team in the Alliance will still play and receive points for the Match.

**Disqualifications.** A Team that is Disqualified in a Qualification Match receives zero (0) points for the Match. The other Team on their Alliance will still receive points for the Match.

- **a.** In Finals Matches, Disqualifications apply to the entire Alliance, not just one Team. An Alliance that is Disqualified in a Finals Match will receive zero (0) points.
Teams playing in Finals Matches. The number of Finals Matches, and therefore the number of Teams who will participate in Finals Matches, is determined by the Event Partner. Events that qualify teams directly to VEX Worlds must have a minimum of five (5) Finals Matches if there are ten (10) or more Teams in attendance.

Finals Match Schedule. Finals Matches are played sequentially, starting with the lowest-ranked Alliance. Each Alliance will participate in one (1) Finals Match. The Alliance with the highest Finals Match score is the Teamwork Challenge champion.

a. Alliances are ranked by their Finals Match score. The highest-scoring Alliance is in first place, the second highest scoring Alliance is in second place, etc.

b. Ties for first place will result in a series of tiebreaker Finals Matches, starting with the lower-seeded Alliance. The Alliance with the highest tiebreaker Finals Match score will be declared the Teamwork Challenge champion.

i. If the tiebreaker Finals Match scores are tied, the Alliance with the higher Match Stop Time will be declared the winner.

ii. If the Match Stop Time is also tied, a second series of tiebreaker Finals Matches will be played. If this second series of tiebreaker Finals Match is also tied, then the higher-seeded Alliance will be declared the winner.

c. If there is a tie for a place other than first, the higher-seeded Alliance will receive the higher rank.

Example 1: Alliance 6 and Alliance 3 are tied for first place. During the tiebreaker Finals Match, Alliance 6 scores 13 points and has a Match Stop Time of 12 seconds. Alliance 3 scores 13 points and has a Match Stop Time of 10 seconds. Alliance 6 is the Teamwork Challenge winner.

Example 2: Alliance 4 and Alliance 5 are tied for third place. Alliance 4 is the third place winner and Alliance 5 is the fourth place winner. In this way, the lower-ranked Alliance must “overcome” the higher-ranked Alliance in order to become the Teamwork Challenge champion.

Fields and Field Elements may be repaired at the Event Partner’s discretion. All competition fields and other Field Elements at an event must be set up in accordance with the specifications in Appendix A and I or other applicable support materials. Minor aesthetic customizations or repairs are permitted, provided that they do not impact gameplay (see <T20>).

Examples of permissible modifications include, but are not limited to:

- Using a VEX IQ part of a different color than the original Field Element for a minor repair
- Gluing together static Field Elements (such as the Fence)
- Adding extra VEX IQ pins, or using longer VEX IQ pins, where Field Elements connect to the Floor / Field Perimeter
- Using metal shafts instead of plastic shafts (with caution - see Appendix A)
Examples of prohibited modifications include, but are not limited to:

- Unofficial Field Perimeter walls or Field Elements
- Additional VEX IQ parts attached to a Field Element (other than pins as listed above)
- Moving the placement of any Field Element, for any reason

Any specific repairs and/or modifications which pertain to the current season’s game will be documented in this rule and Appendix A, as needed.

<T16> Students must be accompanied by an Adult. No Student may attend a VEX IQ Competition event without a responsible Adult supervising them. The Adult must obey all rules and be careful to not violate student-centered policies, but must be present at the event in the case of an emergency.

<T17> Robots at the field must be ready to play. If a Team brings their Robot to the Field, it must be prepared to play (i.e., batteries charged, sized within the starting size constraint, etc.)

a. Robots must be placed on the field promptly. Repeated failure to do so could result in a violation of <G1>.

<T18> Be prepared for minor field variance. Field Element tolerances may vary from nominal by ±1.0", unless otherwise specified. Disc weights may vary from nominal to ±2 grams. Teams are encouraged to design their Robots accordingly. Please make sure to check Appendix A for more specific nominal dimensions and tolerances.

<T19> Match Replays are allowed, but rare. Match replays, (i.e., playing a Match over again from its start) are at the discretion of the Event Partner and Head Referee, and will only be issued in the most extreme circumstances. Some examples that may warrant a Match replay are as follows:

a. Score Affecting “Field fault” issues
   i. Discs not starting in the correct positions
   ii. Field Elements detaching or moving beyond normal tolerances, not a result of Robot interactions
b. Score Affecting game rule issues
   i. A Field is reset before the score is determined
The Event Partner has ultimate authority regarding all non-gameplay decisions during an event. The Game Manual is intended to provide a set of rules for successfully playing VEX IQ Competition Slapshot; it is not intended to be an exhaustive compilation of guidelines for running a VEX Robotics Competition event. Rules pertaining to an event venue, pit spaces, health and safety, or other unique circumstances are at the discretion of the Event Partner and should be treated with the same respect as the Game Manual.

This rule exists alongside <G1>, <S1>, and <G3>. Even though there isn’t a rule that says “don’t steal from the concession stand,” it would still be within an Event Partner’s authority to remove a thief from the competition.
2022 - 2023
Appendix A - Field Overview and Specifications
[1854.5mm]  
73.0in  
Outer Dimension

[2518.7mm]  
99.2in  
Outer Dimension

[2464.1mm]  
97.0in

[27.3mm]  
1.1in  
Wall Thickness

[1909.1mm]  
75.2in  
Outer Dimension
1. 8x Disc stacked in the purple dispenser
2. 10x Disc stacked in two rows of 5 in the blue dispenser
3. 9x Disc in a single row in the yellow dispenser
Approximate Weight: 10g
Push in to Release Disk

[25.9mm] 1.0in
Note: The purple Dispenser is only intended to be rotated counter-clockwise.

See <G11> for more information.
Correct Arm Build:

Correct:

Incorrect:

Q: Why doesn’t my purple dispenser spin freely?

A: The arm can jam if either the standoff above the ratchet pawl or the pawls on the end of the arms are placed incorrectly. Checking your build against steps 30-31 and 36-37 of the VIQC Slapshot Build Instructions might help identify the problem.

Q: Why has my plastic shaft broken?

A: When the arm is jammed the torque produced from turning the wheel is enough to snap the shaft.

Q: Why can’t I replace the plastic shaft with a steel one?

A: The plastic shaft was designed as an intended failure point to protect other parts of the dispenser that are not as noticeable. A steel shaft will not fail as intended, and unseen damage can lead to intermittent issues such as the Dispenser skipping or taking more rotations to dispense.
STARTING CONFIGURATION OF THE ARM IS TOUCHING THE BOTTOM DISC
Robot Skills Challenge Rules

<RSC1> Standard rules apply in most cases. All rules and scoring from previous sections apply to Skills Matches, unless otherwise specified.

<RSC2> Skills Scoring and Ranking at events. For each Skills Match, Teams are awarded a score based on the standard game and scoring rules. Teams will be ranked based on the sum of their highest Programming Skills Match score and their highest Driving Skills Match score from the event.

   a. If two Teams are tied for the highest score, the tie will be broken by looking at both Teams’ next-highest Programming Skills Match score. If the Teams remain tied, the tie will be broken by looking at both Teams’ next-highest Driving Skills Match score. This process will repeat until the tie is broken. If a Team only plays one (1) or two (2) of either their available Programming or Driving Skills Matches, their score for the unattempted Match(es) will be considered a zero (0) when determining the winner of ties.

   b. If the tie cannot be broken (i.e., both Teams have the exact same scores for each Programming Skills Match and Driving Skills Match), then the following ordered criteria will be used to determine which Team had the “best” Programming Skills Match:
      i. Points for Discs Scored in Goal Zones
      ii. Points for Contact Zone bonuses
      iii. Points for Removed Discs

   d. If the tie still cannot be broken, the process in <RSC2b> will be applied to the Team’s highest Driving Skills Match.

   e. If the tie still isn’t broken, the Event Partner may choose to allow Teams to have one more deciding Match, or both Teams may be declared the winner.

<RSC3> Skills Rankings Globally. Teams’ Robot Skills scores are ranked globally based on the following tiebreakers:

   a. Highest Robot Skills score (combined Programming and Driving Skills Score from a single event)
   b. Highest Programming Skills score
   c. Highest Driving Skills score
   d. Earliest posting of the Highest Programming Skills score (i.e., the first Team to post a score ranks higher than other Teams that post the same score at a later time).
   e. Earliest posting of the Highest Driving Skills score (i.e., the first Team to post a score ranks higher than other Teams that post the same score at a later time).
**<RSC4> Skills Match Schedule.** Teams play Skills Matches on a first-come, first-served basis or by a pre-scheduled method determined by the Event Partner. Each Team will get the opportunity to play exactly three (3) Driving Skills Matches and three (3) Programming Skills Matches at an event.

If Skills Matches are offered on a first come, first-served basis, Teams should review the event agenda and their Match schedule to determine when the best possible time is to complete their Robot Skills Matches. If the Robot Skills area closes before a Team has completed all six (6) Robot Skills Matches, but it is determined by the Event Partner that there was adequate time given, then the Team will automatically forfeit those unused Matches.

**<RSC5> Handling Robots during a Programming Skills Match.** A Team may handle their Robot as many times as desired during a Programming Skills Match.

- a. Upon handling the Robot, it must be immediately brought back to any legal starting position.
  - i. Drivers may reset or adjust the Robot as desired from this position, including pressing buttons on the Robot Brain or activating sensors.

- b. Any Discs being controlled by the Robot while being handled must be removed from the Field. “Controlled” requires that the Robot was manipulating the Disc and not simply touching it (e.g., if the Disc moves with the Robot either vertically or while turning, the Robot is controlling the Disc).

- c. Any Discs in the new starting position must be removed from the Field for the remainder of the Match.

- d. During a Programming Skills Match, Drivers may move freely around the Field, and are not restricted to the Driver Station when not handling their Robot.
  - i. The remainder of <G7>, which states that Drivers are not allowed to use any communication devices during their Match, still applies.
  - ii. An intent of this exception is to permit Drivers who wish to “stage” Robot handling during a Programming Skills Match to do so without excessive running back and forth to the Driver Station.

*Note: This rule only applies to Programming Skills Matches. Driving Skills Matches are still governed by <G8> & <G12>, especially for strategic violations.*
<RSC6> **Starting a Programming Skills Match.** Drivers must start a Robot’s Programming Skills Match routine by pressing a button on the Robot Brain or manually activating a sensor. Because there is no VEX IQ Controller hand-off, only one (1) Driver is required for a Programming Skills Match (though Teams may still have two (2) if desired).

a. Pre-Match sensor calibration is considered part of the standard pre-Match setup time, (i.e., the time when the Team would typically be turning on the Robot, moving any mechanisms to their desired legal start position, etc.).

b. Pressing a button on the VEX IQ Controller to begin the routine is not permitted. To avoid any confusion, Teams are advised not to bring controllers to Programming Skills Matches.

In accordance with <T17>, Teams should be mindful of event schedules and set their Robot up as promptly as possible. The definition of “prompt” is at the discretion of the Event Partner and Head Referee, and could depend on things like how much time is left for the Skills Challenge field(s) to be open, how many Teams are waiting in line, etc. As a general guideline, three seconds to calibrate a Gyro Sensor would be acceptable, but three minutes to debug a program would not.

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**League Events**

At league events in which Teams may submit Robot Skills Challenge scores across multiple days / sessions, the Robot Skills scores (combined highest Programming Skills Match and Driving Skills Match scores) used for rankings will be calculated from Matches within the same session.

For example, consider the following scores for a hypothetical Team across two league event sessions:

<table>
<thead>
<tr>
<th></th>
<th>Programming Skills Match</th>
<th>Driving Skills Match</th>
<th>Robot Skills Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>100</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Session 2</td>
<td>150</td>
<td>40</td>
<td>190</td>
</tr>
</tbody>
</table>

This Team would have a Robot Skills score of 200 for this event, and their scores from Session 1 would be used for the Event and Global tiebreakers listed in the above two sections.
Robot Skills Challenge Format Options

To better accommodate varying health & safety circumstances in different regions, the 2022-2023 season will feature different avenues for Event Partners to host Robot Skills Challenge competitions. Regardless of the format chosen for a given event, all rules and information in this Appendix apply. However, some formats will have additional rules in place to ensure fair and consistent gameplay.

Robot Skills Challenge at a Standard Qualifying Tournament

- The Robot Skills Challenge is an optional event for all Teams. Teams who do not compete will not be penalized in the Teamwork Challenge portion of the tournament. However, participation in the Robot Skills Challenge may impact eligibility for judged awards at the event.
- Teams may play Robot Skills Matches on a “first come, first served” basis, or by a pre-scheduled method determined by the Event Partner.
- Teams will be given the opportunity to play exactly three (3) Programming Skills Matches and three (3) Driving Skills Matches. Teams should be aware of when the Robot Skills fields are open so that they do not miss their opportunity, (e.g., if a Team waits until five minutes before the Robot Skills fields close, then they have not used the opportunity given to them and will not be able to compete in all six matches).

Skills-Only Event: In-Person, Live

- Teams may play Robot Skills Matches on a “first come, first served” basis, or by a pre-scheduled method determined by the Event Partner.
- Further details regarding Skills-Only Event logistics can be found in the REC Foundation Qualification Criteria document.

Skills-Only Event: Remote, Live

1. The Remote Skills Only environment (i.e. digital platform) may be chosen at Event Partner discretion.
   a. All registered Teams must be able to view live the Matches being played by all other registered Teams.
   b. REC Foundation Staff must have access to view all matches while being played live.
   c. The online meeting environment must not be accessed or viewed by the general online public while the event is live, e.g. the event must be password protected or invite-only.
      i. Guests invited by the Event Partner can be able to view, but may not have use of their microphone or camera or display anything for teams to see or hear.
      ii. One example that would satisfy this requirement would be to use an online video conferencing application that allows for a large number of people who must register to attend. The Event Partner would approve spectators who can view the matches, but would only give Teams the ability to share their screen, camera or microphone.
      iii. After the event is over, there are no such restrictions (i.e. the Event Partner may post a recording of the event if they wish).
2. Registered Teams will be assigned scheduled times to complete Robot Inspection and up to (3) Programming Skills Matches and (3) Driving Skills Matches over a live, online environment.

3. The minimum event staff must include one (1) Event Partner and at least one (1) certified Head Referee. A dedicated Tournament Manager operator is also recommended, but not required, if the Head Referee and / or Event Partner wish to fulfill this role.

4. At all times, there must be a minimum of (2) Adults over the age of 18 in the remote meeting environment before Students are allowed to connect. One of those Adults must be the Event Partner.

5. The Team’s Primary Contact, or another designated Adult Team contact (over the age of 18), must be present in the remote meeting environment throughout the duration of the scheduled time for that Team. The Team’s Primary Contact will be responsible for providing the Adult representative's contact information to the Event Partner prior to the event.

6. Teams will complete a full Robot inspection, in accordance with the game manual, live with the Head Referee prior to their first Robot Skills Match. This inspection process should follow the checklist on a standard inspection sheet, including a demonstration of sizing compliance as explained in. Note: This inspection may also include an informal “Field inspection”, to ensure that a Team’s remote environment is set up properly for their Matches.

7. All Team camera footage must be streamed live, from one camera feed, with no “cuts”.
   a. Pre-recorded Robot Skills Matches are strictly prohibited in a Live, Remote event.
   b. The Driver(s), Robot(s), Controller(s) and complete competition field must remain on camera at all times during the Match.
   c. A Stopwatch / Tournament Manager display that shows the match time must be on video the entire time during the Match.
   d. The camera must be able to move around the field, with no breaks or “cuts”, so that it can verify standard Head Referee checks before and after the Match. These could include (but are not limited to) Starting Position placement, game and field element placements, and any necessary scoring verification.
      i. If this is not feasible due to a Team’s equipment or facility limitations, a second camera stream must be used for these close-up checks. This is the only permissible exception to the “single-camera” rule set forth by , and Teams utilizing this exception should expect additional scrutiny.

8. Live, Remote Robot Skills Matches must include some live interaction between the Team and the Head Referee.
   a. A Driver must pair their Controller to their Robot on video prior to each Match.
   b. The Head Referee must ask the Team if they are ready, and the Team must respond verbally / visually on video.
      i. If the Head Referee needs to see a closer or different angle of the Robot Starting Position or any field elements, the Team must be able to satisfy this request.
c. The Match will begin with the Team member who is controlling their clock to give a countdown for the Match to start. This person does not need to be a Driver.

d. After the Match, Teams must move the camera per the Head Referee’s instructions to verify scored game elements before the field is reset. The Head Referee will confirm to the Team verbally what is being counted.

i. <T1> and <T3> still applies - the Head Referee’s judgment based on what can be seen on camera is final, as it would if they were observing it in person. There are no video or photo replays in a Live, Remote Skills-Only Event. One common example will be for a referee to ask a Team to move the camera over to a goal to show if Discs are properly scored in that Goal. The Head Referee will ask the Team a series of questions, and might ask for a couple of different camera angles, but once the referee makes a determination based on these questions and viewing angles, the referee’s decision is final.

9. Match replays are at the discretion of the Head Referee. In addition to the examples provided in <T19>, live video circumstances (such as a video cutting out, or a Match timing error) could warrant a Match replay at the Head Referee’s discretion.

10. Any violation of any rules will result in the Match score being recorded as zero. That Match will count as one of the Team’s allotted Matches.