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APPENDIX

The Programming Skills Challenge

Overview

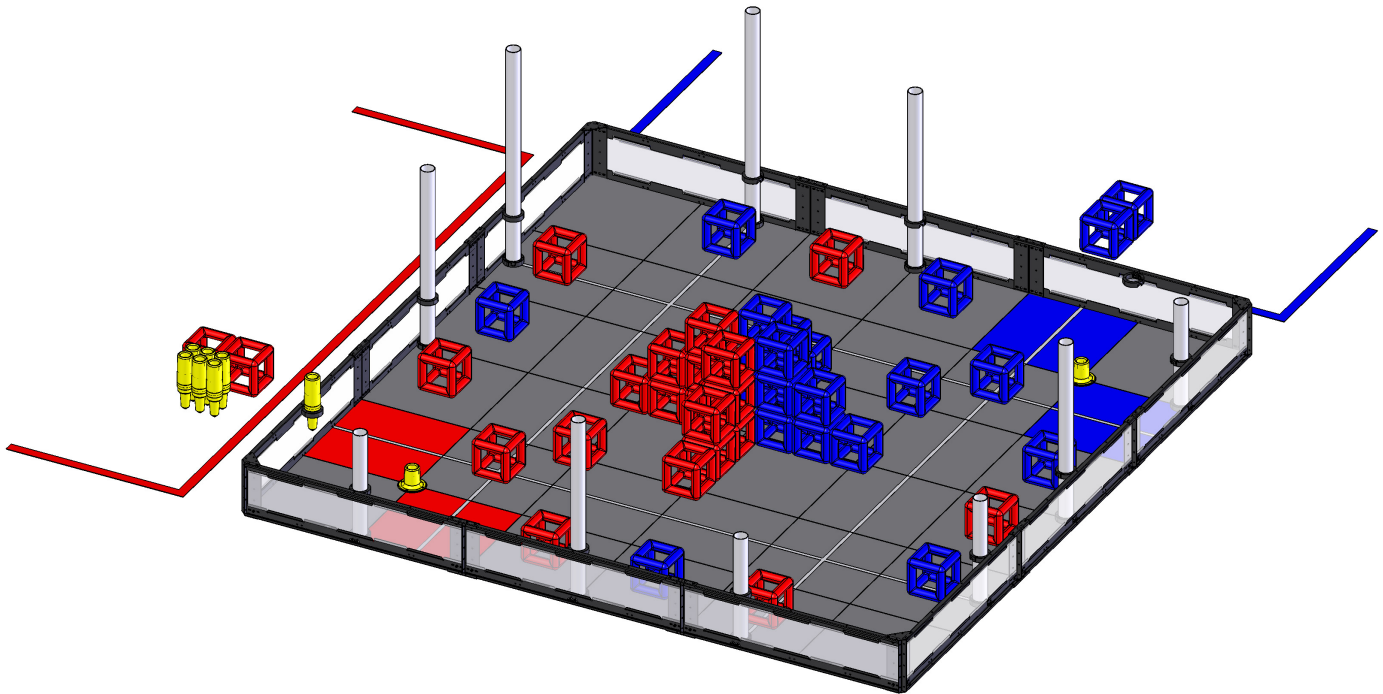


This section describes the Programming Skills Challenge of *VEX Skyrise*.

Please note that the Programming Skills Challenge may not be offered at all tournaments. Please check with your local event organizer, or www.robotevents.com for more information.

Programming Skills Challenge Description

In this challenge teams will compete in sixty (60) second long matches in an effort to score as many points as possible. These matches will be autonomous, with limited human interaction. The playing field will be set up identically to that of a normal *VEX Skyrise* tournament match.



Note: The Programming Skills Challenge and the Robot Skills Challenge use the same field setup!
(Please see "The Game" section of the manual for further information on field setup. Please note, there are only seven (7) Skyrise Sections available in the Skills Challenges)

Programming Skills Challenge Definitions

Please note that all definitions from “The Game” section of the manual apply to the Programming Skills Challenge, unless otherwise specified.

Programming Skills Match – A *Programming Skills Match* consists of a sixty (60) second *Autonomous Period*. There is no *Driver Controlled Period*. Teams can elect to end their run early, however this will count as an official run.

Programming Skills Preload – The four (4) *Cubes* each team must place on the field prior to each *Programming Skills Challenge Match*. The *Cube* that starts on the same *Alliance Starting Tile* as the *Robot* must be placed such that it is touching its *Robot*, not touching any grey foam tiles, and fully within the field perimeter. Each of the other three (3) *Cubes* must be placed on each of three remaining *Alliance Starting Tiles*, not touching any grey foam tiles, and fully within the field perimeter. (i.e. There must be one *Cube* on each *Alliance Starting Tile*)

Programming Skills Challenge Rules

Please note that all rules from “The Game” section of the manual apply to the Programming Skills Challenge, unless otherwise specified.

<PSC1> At the beginning of each *Programming Skills Match*, the *Robot* must be placed such that it is touching any single *Alliance Starting Tile*, not touching any *Scoring Objects* other than those permitted by <PSC2>, and not touching any other foam field tiles, the *Skyrise Base*, any *Post*, or the *Autoloader*.

<PSC2> Prior to the start of each *Programming Skills Match*, each team will have four (4) *Cubes* available as *Programming Skills Preloads*. The *Cube* that starts on the same *Alliance Starting Tile* as the *Robot* must be placed such that it is touching its *Robot*, not touching any grey foam tiles, and fully within the field perimeter. Each of the other three (3) *Cubes* must be placed on each of three remaining *Alliance Starting Tiles*, not touching any grey foam tiles, and fully within the field perimeter. (i.e. There must be one *Cube* on each *Alliance Starting Tile*)

<PSC3> *Student Drive Team Members* may handle their own *Robot* while the *Robot* is in contact with their own *Alliance Starting Tile* (i.e. the tile the *Robot* started the match on), within the following restrictions.

- i. *Student Drive Team Members* may only interact with a *Robot* if it is touching their own *Alliance Starting Tile* and no part of the *Robot* is touching a gray foam tile, except the interaction allowed in <PSC3ii>
- ii. If any part of a *Robot* is touching a grey foam tile, the only interaction that will be allowed is to bring the *Robot* fully into the legal *Alliance Starting Tile*, into a legal position as per <PSC3i>
- iii. After any legal interaction with the robot by *Student Drive Team Members*, and prior to the robot attempting to score or interact with *Scoring Objects*, the robot must be in a position such that it is touching the legal *Alliance Starting Tile* and no part of the *Robot* is touching a gray foam tile; a legal position as per <PSC3i>. i.e. Before the *Robot* leaves the *Alliance Starting Tile*, *Student Drive Team Members* may not be touching the robot. If *Student Drive Team Members* touch the *Robot* again, it must be touching a legal *Alliance Starting Tile* and it must immediately be brought fully back onto the tile. **Note:** *Robots* that hang over the edge of the *Alliance Starting Tile*, but do not touch any gray foam tiles, are considered to be in legal positions for interaction as per <PSC3>
- iv. *Student Drive Team Members* may only interact with a *Robot* if they are in their *Alliance Station* or in the general vicinity of the *Alliance Robot Interaction Spot* that corresponds to the *Alliance Starting Tile* the *Robot* is on.
- v. *Student Drive Team Members* may only interact with their *Robot* up to two (2) times in any given *Programming Skills Match*. An interaction begins when the *Robot* is first legally handled by a *Student Drive Team Member* and ends once the *Robot* leaves the *Alliance Starting Tile* following the initial handling.

During contact with the *Robot*, the *Student Drive Team Members* may not intentionally manipulate or modify the position of any *Scoring Objects* relative to the *Robot's* overall system, either by direct hand contact or indirect contact via the *Robot*. (i.e. it is acceptable to change the orientation of a *Robot* that includes *Scoring Objects* in it as long as the position of the elements relative to the *Robot* is not changed).

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Student Drive Team Members also may not change the configuration of the *Robot*. (i.e. it is okay to reposition the robot relative to the field, but it is not okay to manually lift up the *Robot's* arm).

The intent of this rule is to allow teams to fix *Robots* that are unable to move, to reposition and/or reorient *Robots*, and to activate additional autonomous modes by interacting with the *Robot* via sensors or buttons. The intent of this rule is not to allow teams to manipulate their *Robot* in such a way that they are controlling the *Robot* via human contact or creating motions that lead to scoring.

Violations of this rule will result in a warning for minor offenses which do not affect the final score of the *Programming Skills Challenge Match*. Egregious (match affecting) offenses will result in a score of zero (0). Teams who receive multiple warnings may also receive a score of zero (0) at the head referee's discretion.

<**PSC4**> In a *Programming Skills Match*, all *Scoring Objects* are considered to be the same color for purposes of any rules or definitions.

<**PSC5**> A *Robot* may only *Build Skyrise Sections* on the *Skyrise Base* adjacent to the *Alliance Starting Tiles* that the *Robot* started the *Programming Skills Match* on.

<**PSC6**> Teams will only have seven (7) *Skyrise Sections* available to them in a *Programming Skills Match*. These *Skyrise Sections* may only be placed on the *Autoloader* adjacent to the *Alliance Starting Tiles* that the *Robot* started the *Programming Skills Match* on.

Programming Skills Challenge Scoring

All scoring is the same as in a regular VEX Skyrise match.

- A *Cube Scored* in a *Floor Goal* is worth one (1) point
- A *Cube Scored* on a *Post* is worth two (2) points
- A *Post* owned is worth one (1) point.
- A *Built Skyrise Section* is worth four (4) points
- A *Cube Scored* on a *Skyrise* is worth four (4) points

Programming Skills Challenge Format

- The *Programming Skills Challenge* is an optional event. Teams who do not compete will not be penalized in either the main tournament, or the *Robot Skills Challenge*.
- Teams will play *Programming Skills Matches* on a “first come, first serve” basis, or by a method determined by the event.
- Teams will be guaranteed a minimum number of *Programming Skills Matches*, to be determined by the event organizers
- Teams may also be limited to a maximum number of *Programming Skills Matches*, to be determined by the event organizers

Programming Skills Challenge Rankings

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- For each *Programming Skills Match* teams are awarded a score based on the above scoring rules.
- Teams will be ranked based on their highest *Programming Skills Match* score, with the team with the highest score being declared the Programming Skills Challenge Winner.
- In the case where 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 tie cannot be broken (i.e. both teams have the exact same scores for each *Programming Skills Match*), the next tie-breakers will be based on the following criteria in each team's highest scoring *Programming Skills Match*. The tie-breakers are as follows (in order):
 - Number of points for *Built Skyrise Sections*
 - Number of points for *Cubes Scored on Skyrise Sections*
- If the tie still isn't broken, events may choose to allow teams to have one more deciding match or both teams will be declared the winner.

Programming Skills Challenge Heads-Up Match

The following method may be used to determine the Programming Skills Challenge Winner at certain events.

- The top two teams from the Programming Skills Challenge Rankings will advance to a final heads-up match.
- Each team will perform one (1) *Programming Skills Match*, with the 2nd place team performing first or with both teams performing simultaneously on separate fields.
- This *Programming Skills Match* will be a final opportunity for both teams to beat the high score posted in earlier rounds, if neither team beats or matches the previous high score, the holder of the previous high score will be declared the Programming Skills Challenge Winner.
- If one or both teams beat the previous high score, the team with the highest score in the “Heads-Up Match” will be declared the Programming Skills Challenge Winner
- In the case of a tie for highest overall score, the tie will be broken by looking at the second highest score for both teams. (This process of looking at the next highest score will continue until the tie is broken, or all matches have been exhausted)
- If the tie cannot be broken, two winners may be declared, or a new match may be played.