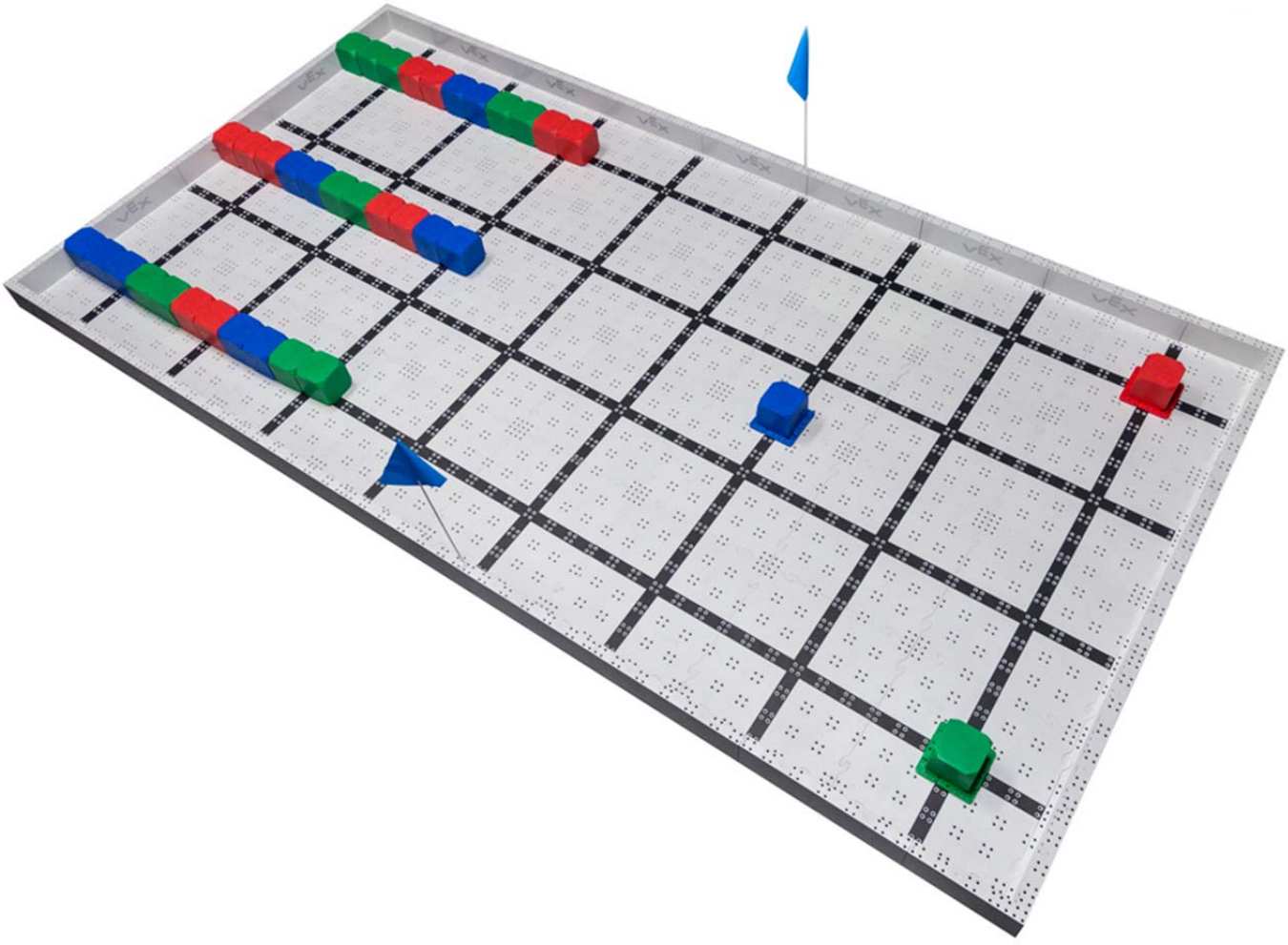
VEX IQ CHALLENGE

HIGHRISE

# Field Appendix



# Introduction

This document will provide detailed specifications, a bill of materials (BOM), and assembly instructions for the Official Competition Field.

Please note that this field utilizes the VEX IQ Challenge Field Tiles & Perimeter kit (228-2550) developed by VEX Robotics. Instructions and specifications for this field perimeter are available in a separate document, and are also important for field assembly.

This document is divided up into four sections:

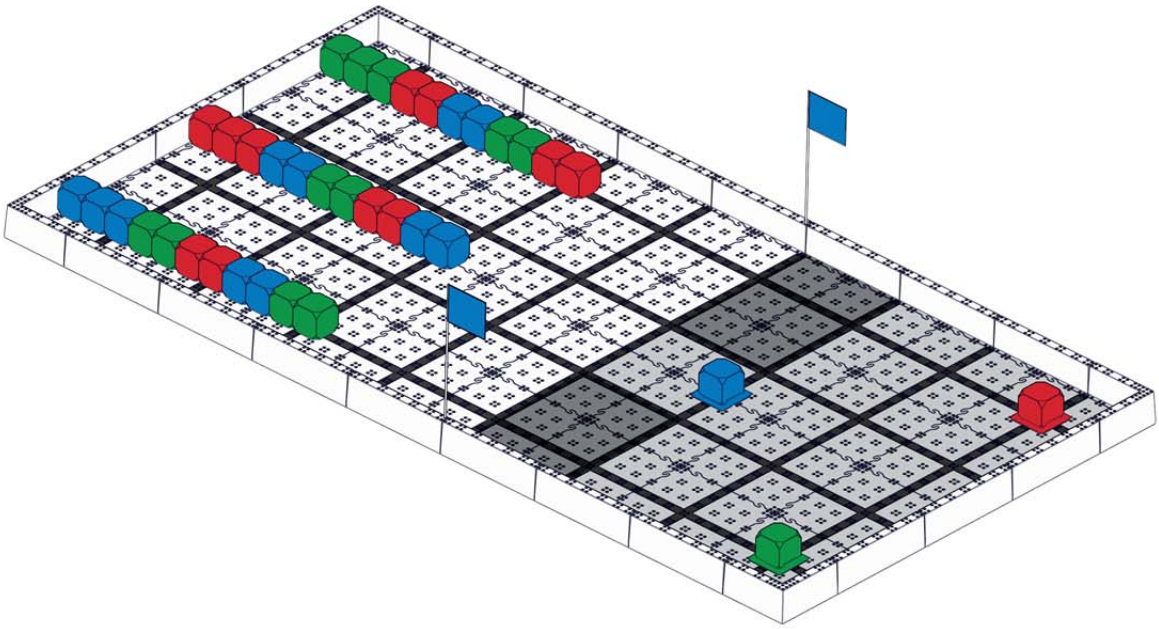
1. Field Overview
2. Field Bill of Materials
3. Field Specifications
4. Field Assembly Instructions

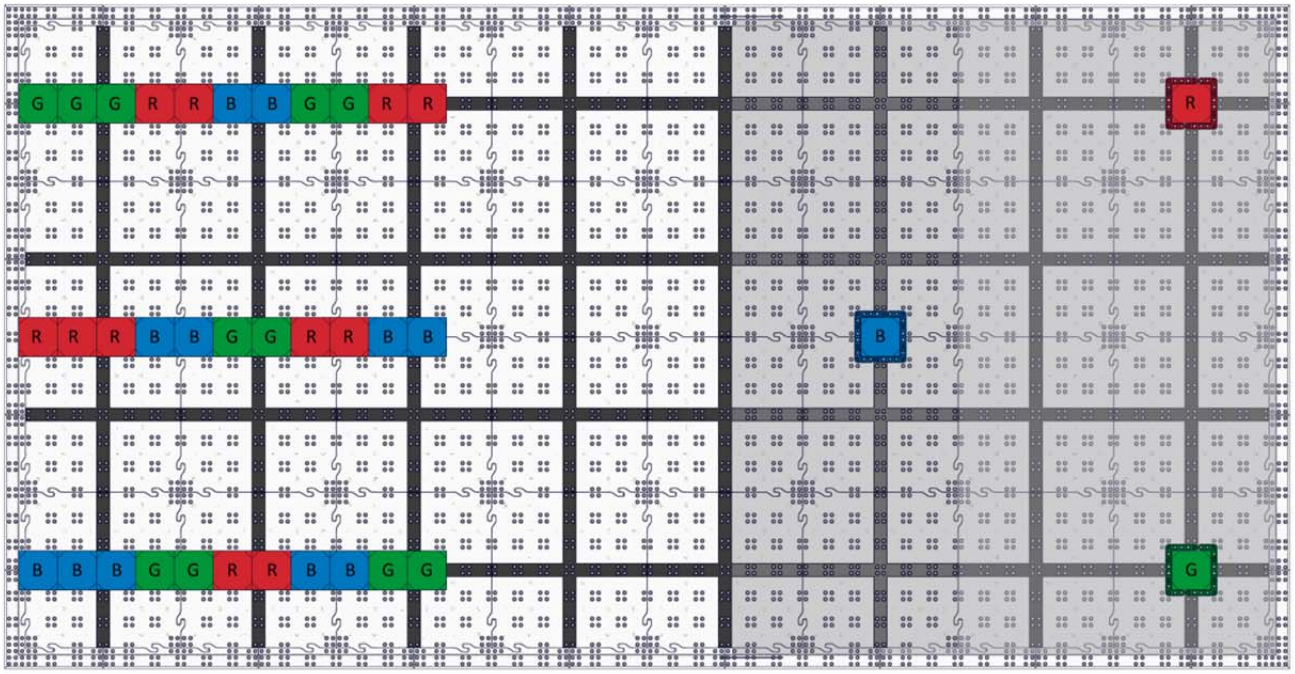
There is also an accompanying STEP file which can be imported into most 3D modeling programs (i.e. Autodesk Inventor). This 3D model not only shows the "official" setup of a *VEX IQ Challenge Highrise* Competition field, but also includes detailed models of all the individual field elements.

For additional game-play detail, please refer to the *VEX IQ Challenge Highrise* competition manual.

## Field Overview

The game *VEX IQ Challenge Highrise* is played on a 4 ft x 8 ft playing field, surrounded by 2-1/2" walls. The playing field floor tiles and walls are modular plastic tiles from the VEX IQ Challenge Field Tiles & Perimeter kit (228-2550) with integrated mounting holes for VEX IQ structural elements. On the sides of the field two blue flags denote the location of the Scoring Zone. (3) Highrise Base Cubes are setup on one end of the field for robots to build Highrises. On the other end of the field (33) cubes, (11) red, (11) green, and (11) blue are available as scoring objects. For more details and specific game-play rules, please refer to the *VEX IQ Challenge Highrise* manual.





# Game Objects & Field Bill of Materials

All these items are available for purchase from: www.VEX.com

## Standard Playing Field – Reusable Each Year

There are two options available for the official *VEX IQ Challenge* playing field. The field is sold as a half field option and as a full field option. Two Half Field kits can be combined to equal a Full Field kit. The *Playing Field* is a standard configuration that will be reusable each year.

| Part Number | Description | Price |
|---|---|---|
| **228-2550** | VIQC Full Field (4ft x 8ft) Tiles & Perimeter Set | $199.98 |
| **228-3051** | VIQC Half Field (4ft x 4ft) Tiles & Perimeter Set | $99.99 |
| | **(Full Field) Total Price** | $199.98 |

## Official *VEX IQ Challenge Highrise* Specific Elements

| Part Number | Description | Price |
|---|---|---|
| **228-3251** | Full *VEX IQ Challenge Highrise* Game Objects<br>Contains All Game Elements for One Complete Field<br>(Field Perimeter & Tiles are NOT included)<br>*(2x) 228-3325 3-inch Cube Kit*<br>*(1x) 228-3452 Cube-Base Kit*<br>*(4x) Blue Flags* | $64.99 |
| | **Total Price** | $64.99 |

## Official Practice Elements

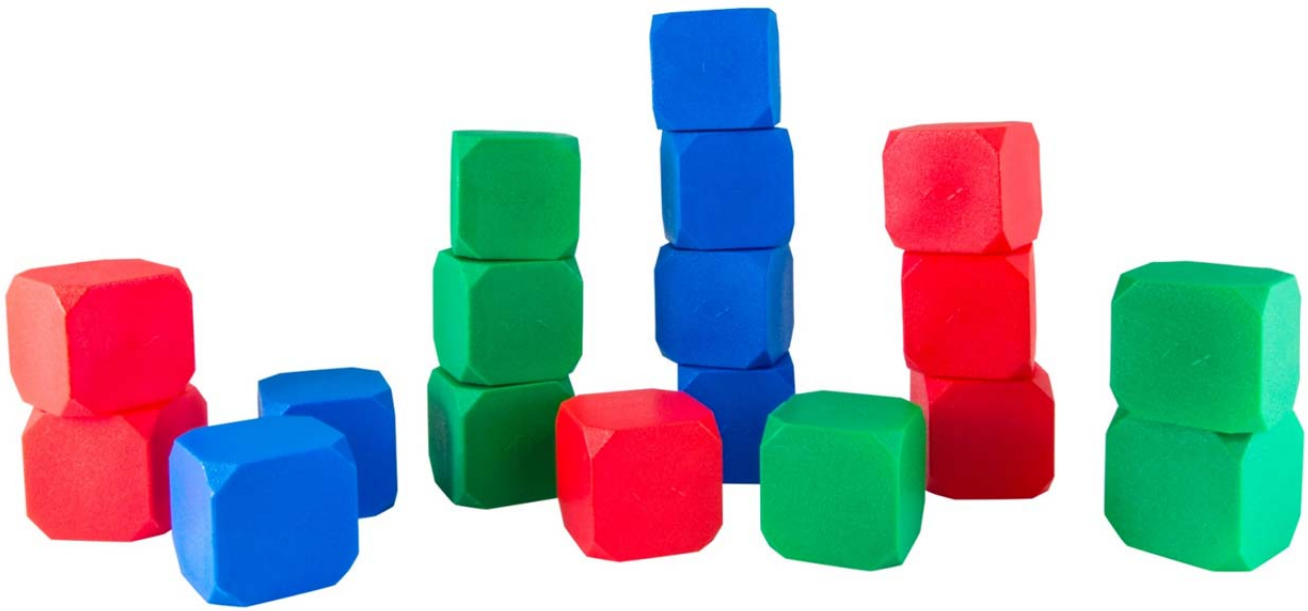
| Part Number | Description | Price |
|---|---|---|
| **228-3325** | *3-inch Cube Kit*<br>*(6) Red Cubes, (6) Blue Cubes, (6) Green Cubes* | $29.99 |
| **228-3452** | *Cube-Base Kit*<br>*(1) Set of Colored VEX IQ Elements to build a full field set of (3) Highrise Bases* | $7.99 |

# Field Specifications

## Introduction

This section will outline the specifications which are most important to teams designing a robot to compete in the VEX IQ Challenge – *Highrise*.

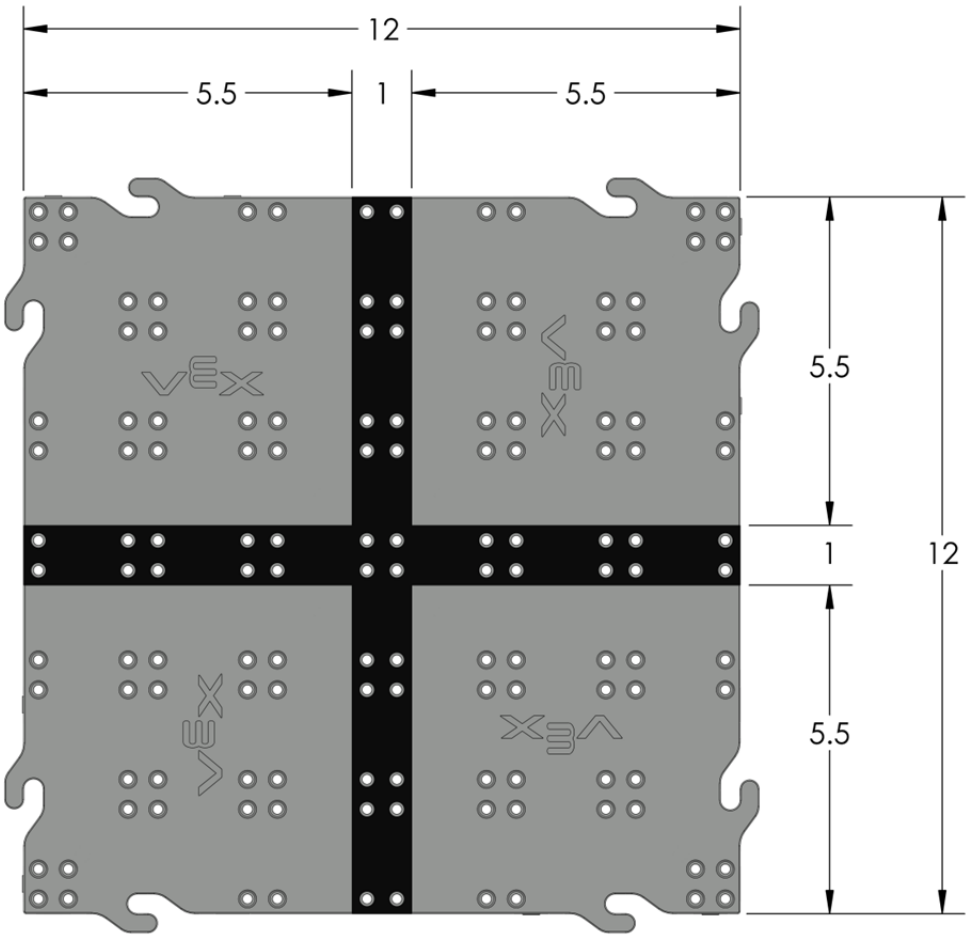
Field components may vary slightly from event to event. This is to be expected; teams will need to adapt accordingly. It is a good design practice to create mechanisms capable of accommodating variances in the field and game pieces.



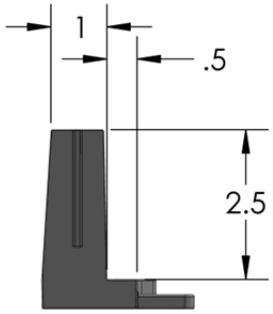
# Field Element Dimensions

The standard VEX IQ Challenge playing field is composed of (32x) floor tiles, (20x) straight wall segments, and (4x) corner wall segments. Each floor tile is 1 foot (305mm) square and molded in a very light grey plastic. Black lines 1 inch (25.4mm) wide for a "+" sign over the top of the tile; these lines are used to determine robot starting squares, corner goals, and can be read by advanced sensors on the robot.

## Floor Tile Dimensions



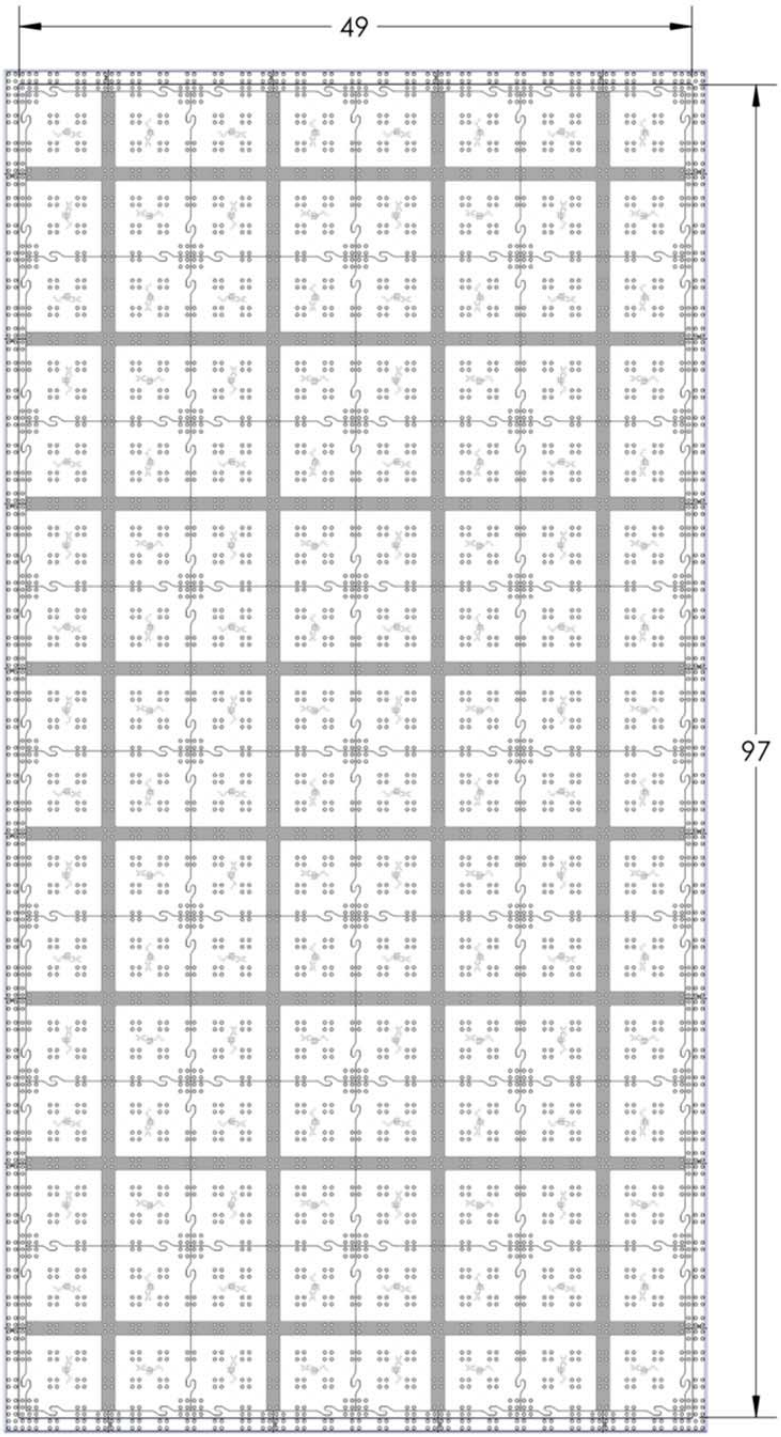

## Perimeter Dimensions (Side View)



# Assembled Field Dimensions

The standard VEX IQ Challenge playing field is composed of (32x) 1ft square tiles. These tiles are arranged in a rectangle that is (4x) tiles wide by (8x) tiles long. A 2-1/2” wall is assembled to the outside of these tiles. All floor tiles and wall sections easily and quickly snap together.

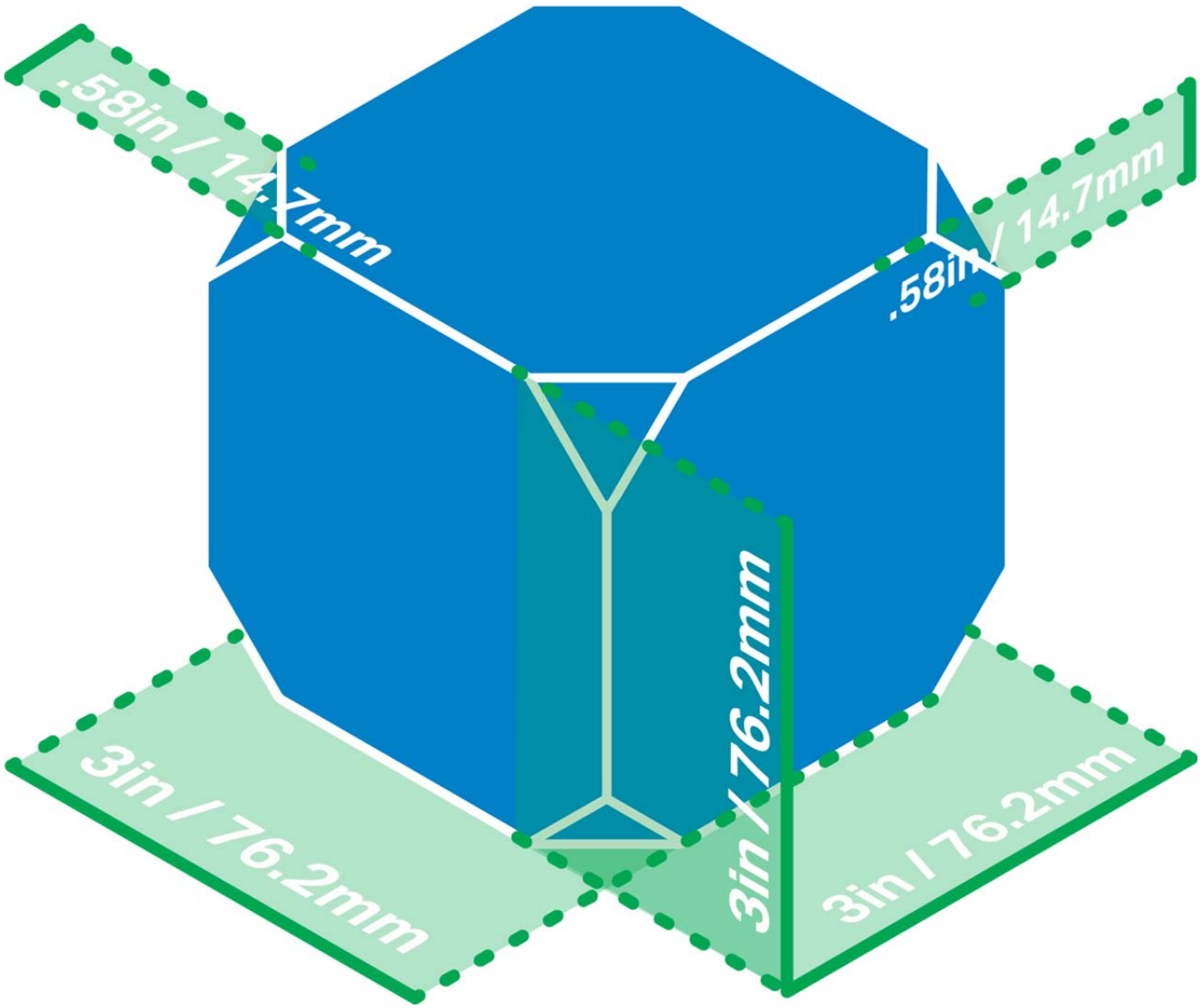
## Inside Dimensions (Between Walls)



# Cube Specifications

The *Cubes* scored in VEX IQ Challenge Highrise are blow-molded hollow plastic. The cubes are 3 inch (76.2 mm) wide x 3 inch (76.2 mm) long x 3 inch (76.2 mm) tall. Each corner of the cube is chamfered. The Cubes each weigh approximately 64 grams (0.14 pounds).

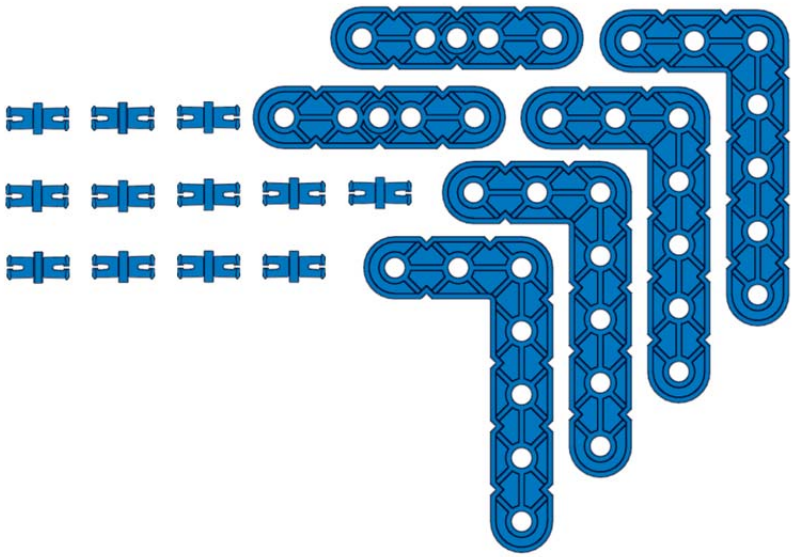
**Cube Dimensions:**




**(Not Actual Size)**

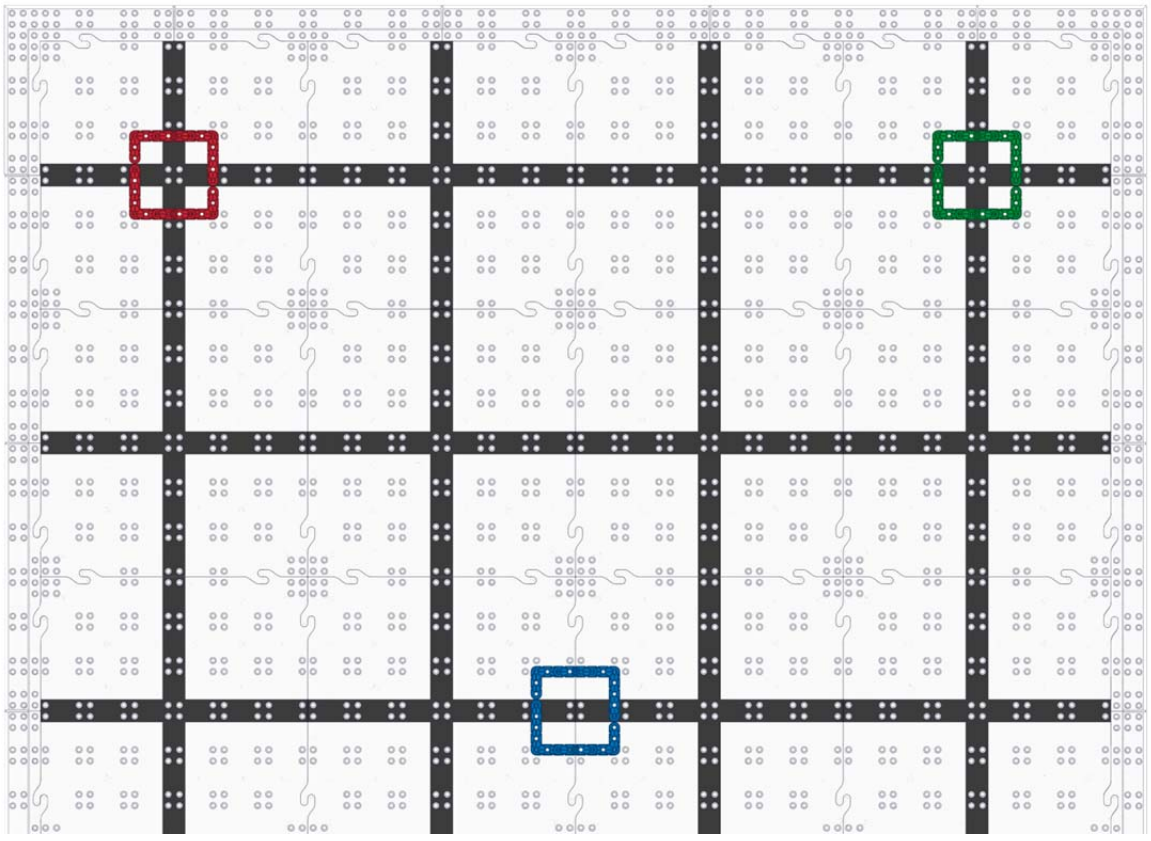
# Field Assembly Instructions

The first step to assembling the field is to attach the Highrise Bases onto the field tiles. The Highrise Bases are constructed from VEX IQ structural pieces (molded in red, blue, and green). Teams who wish to build practice bases can do so out of pieces from their VEX IQ Starter Kit.

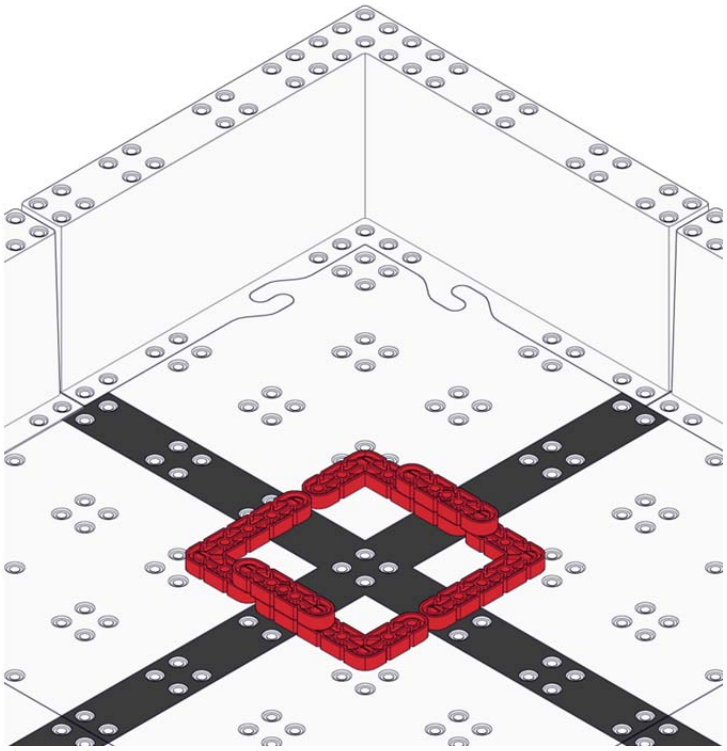


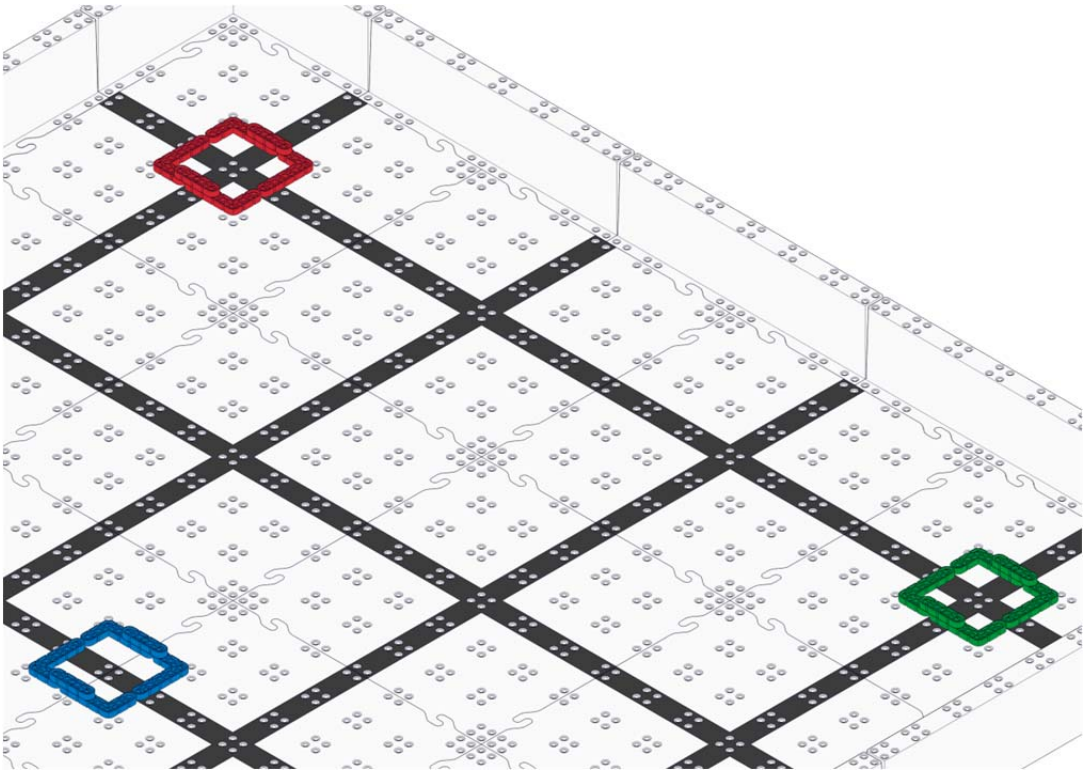
**(Parts for One Highrise Base)**

Highrise Bases should be constructed in the following locations. Blue in the center, Red in the back left of the Scoring Zone, and Green to the back right of the Scoring Zone:

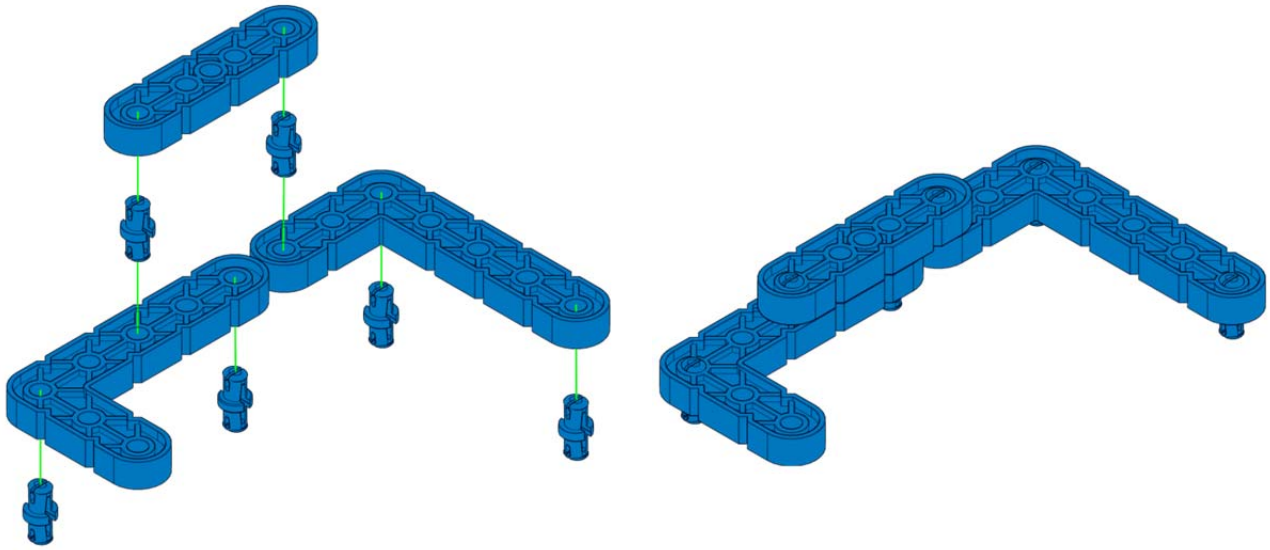


Note, the Highrise Bases should be oriented such that they face as shown in the image below relative to the field. Be careful not to attach them sideways. All three goals face the same direction:

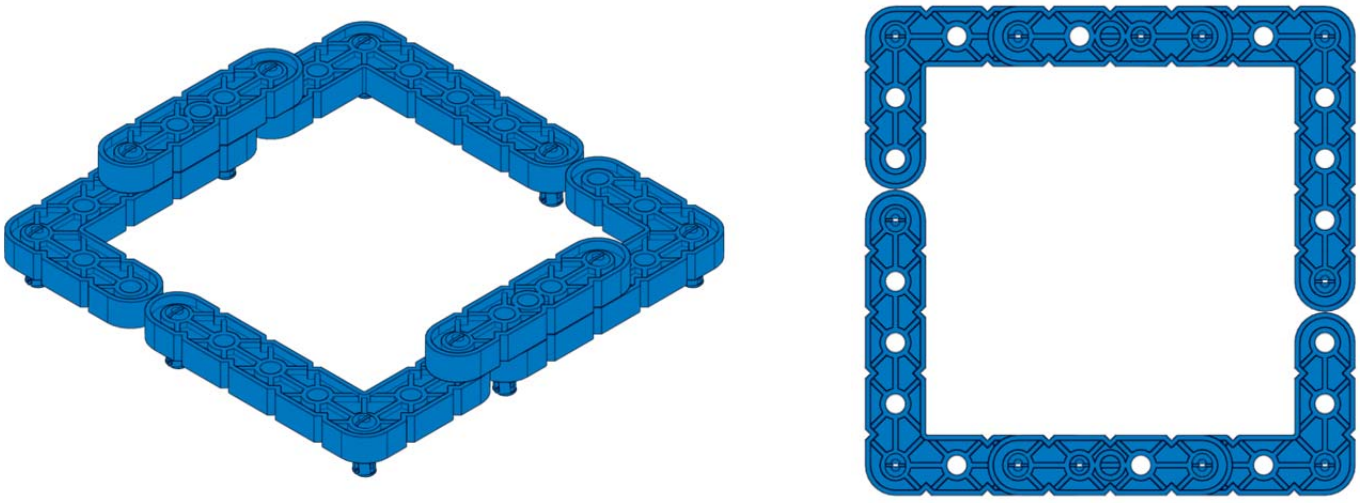




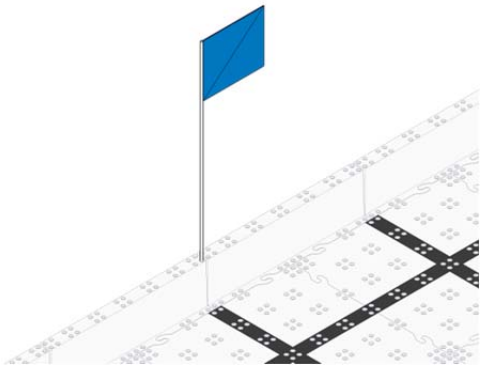
Each Highrise Base should be constructed in the following manner. First build half the Highrise base, attaching it onto the VEX IQ Field Perimeter Tiles using VEX IQ pins:



Complete the Highrise Base by building another half as shown.
Construct all three Highrise Bases in this same manner – one Red, one Blue, and one Green:



The official boundary of the Scoring Zone is one of the black lines pre-printed onto the VEX IQ Field Perimeter Tiles (as defined in the VEX IQ Challenge Highrise Game Manual).



The scoring zone is marked with two Blue flags. These flags are installed in holes on the VEX IQ Field Perimeter Walls.

Once the Highrise Bases are installed and the Flags are placed to mark the Scoring Zone the only thing left to do is place the cubes. Three cubes are used as Base Cubes and are installed in the Highrise Bases.

The remaining (33) cubes are placed in a pre-set pattern as shown: