TRIPLE THREAT

2017 GAME DESIGN ONLINE CHALLENGE ASTROBOTZ 1231A

VEX ROBOTICS COMPETITION TRIPLE THREAT: A PRIMER

Vex Robotics competition Triple Threat is played on a 12 ft x 12 ft foam mat, surrounded by sheet metal and lexan perimeter. There are 28 Tetras which teams can score into Hoops. Teams can also score points by hanging with Urchin(s). For more details and specific game-play rules, please see Section 1 – The Game.

SECTION 1: THE GAME

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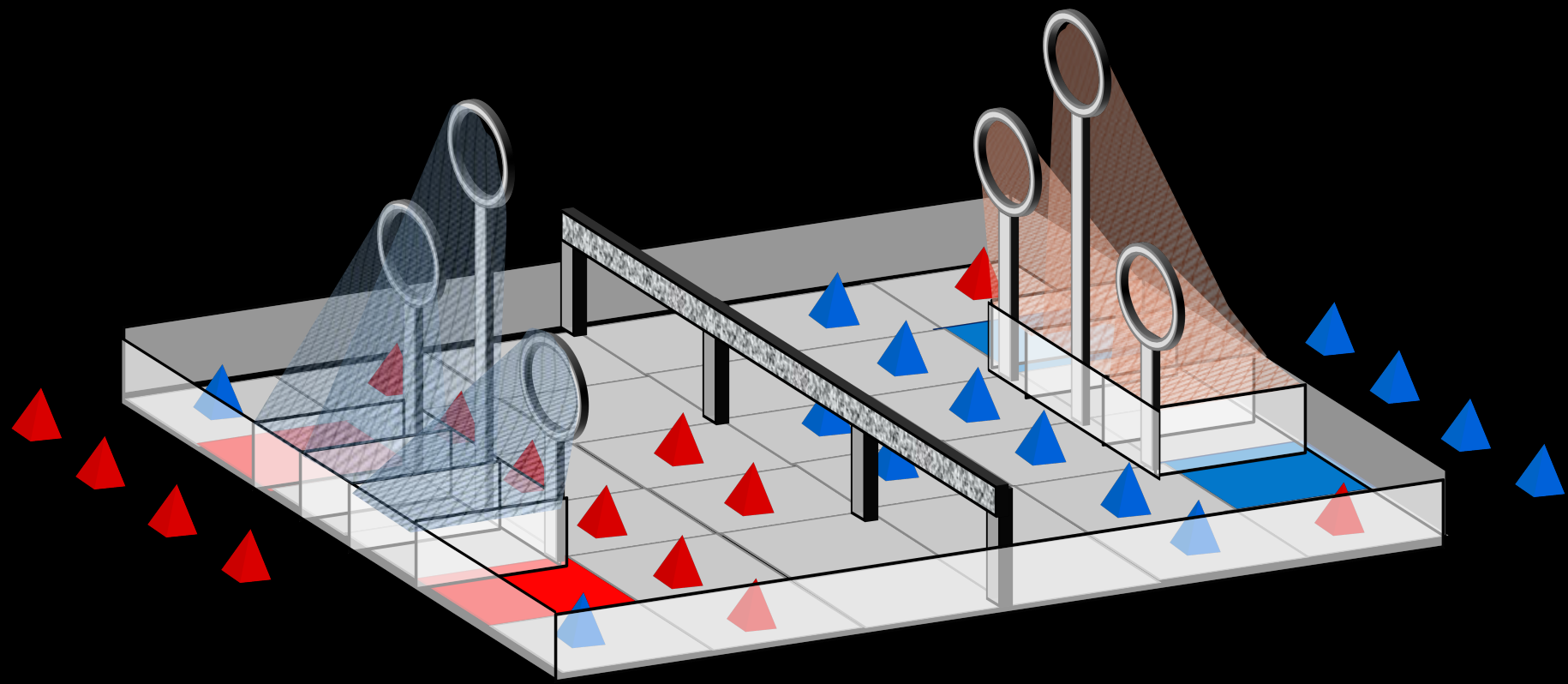
GAME DESCRIPTION

Matches are played on a field set up as illustrated in the figures on the next slide. Two Alliances – one red and one blue – composed of two teams each, compete in each match. The object of the game is to attain a higher score than the opposing Alliance by scoring your Tetras into High, Medium, and Low Hoops opposite of where you start and by hanging your robot – with or without Urchin(s) – on the High Hoop opposite of where you start.

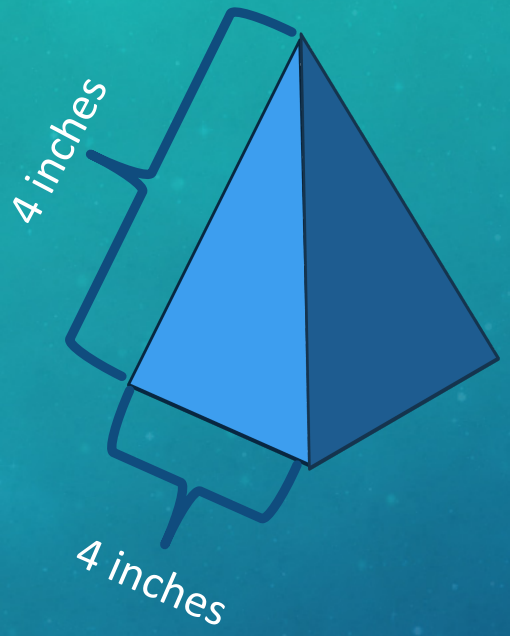
A bonus is awarded to the Alliance that has the most total points at the end of the Autonomous Period.

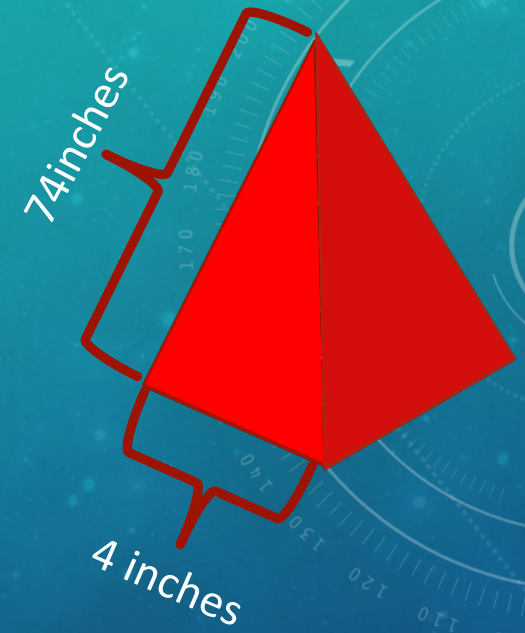
There are a total of 30 scoring objects, 28 Tetras – 14 red and 14 blue – and 2 Urchins, in a VEX Robotics Competition Triple Threat Match. Each robot will have one (1) Tetra available as a Preload prior to the match. Each Alliance will have 2 Tetras available as Driver Control Loads during the last thirty (0:30) seconds of the Match. Twenty (20) Tetras and 2 Urchins will start at designated locations on the field. Each Alliance has one (1) High Hoop from which one (1) robot may hang.

PICTURE OF GAME SET UP:



GAME DEFINITIONS: TETRAS

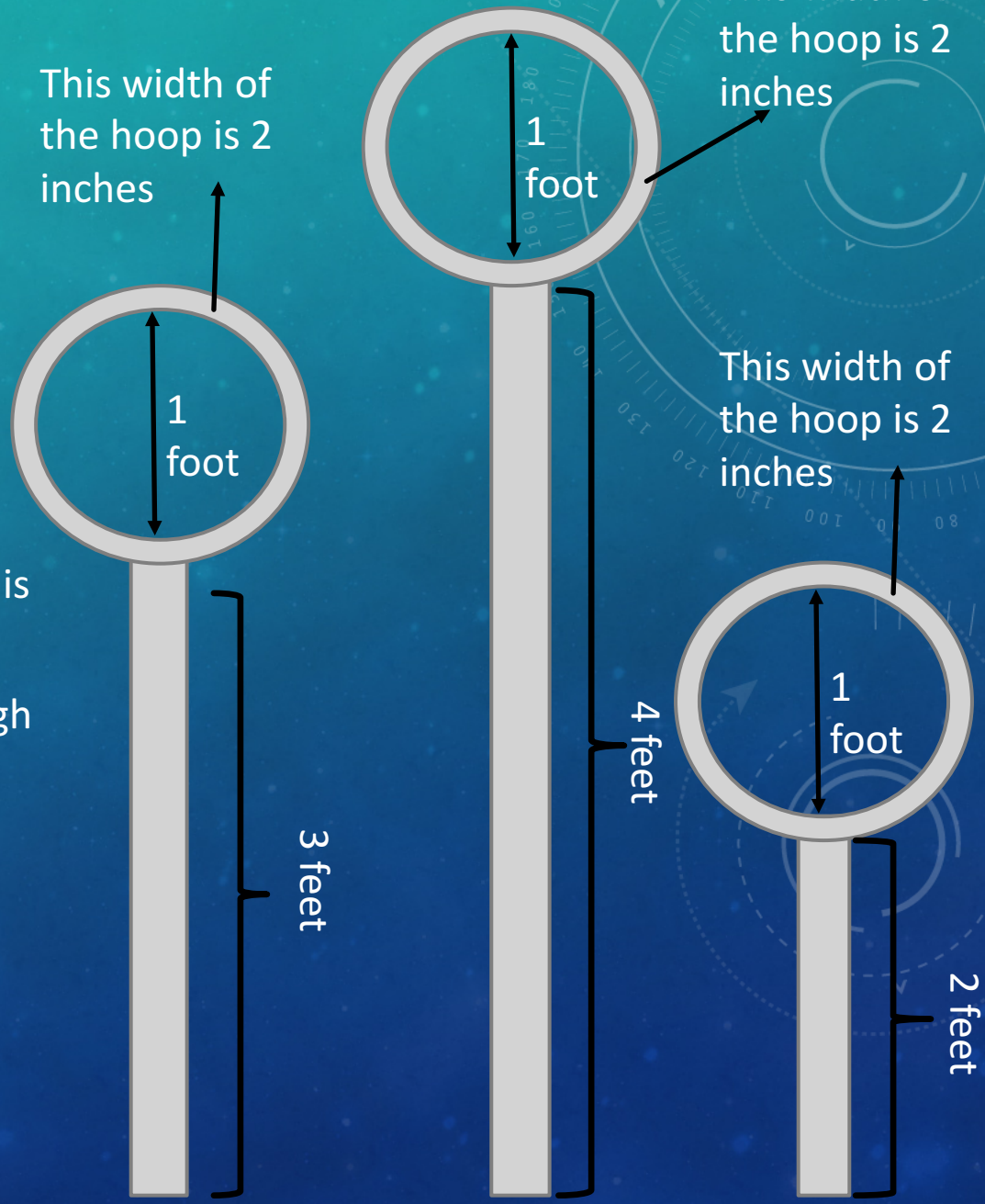




- 28 total foam tetrahedron “Tetras”
- 4 inches tall x 4 inches wide
- 14 Blue and 14 red
- Scored at any time during the match into Low, Medium, and High Hoops on the opposite side of the field.
- 10 red Tetras on the field (red alliance may only pick up red Tetras. If the red alliance scores a red Tetra into the blue alliances goal, those points count for the blue alliance.)
- 10 blue Tetras on the field (blue alliance may only pick up blue Tetras. If the blue alliance scores a blue Tetra into the red alliances goal, those points count for the red alliance.)
- Each alliance has 2 Tetras as preloads, which must be touching the robot for the start of the match
- Each alliance has 2 Tetras as driver loads for the last 30 seconds of the match. These must be placed, not thrown, onto the robot or field. An alliance is penalized 5 points for each driver load that is not fielded before the end of the match.
- If a Tetra leaves the field perimeter, then it stays off the field.

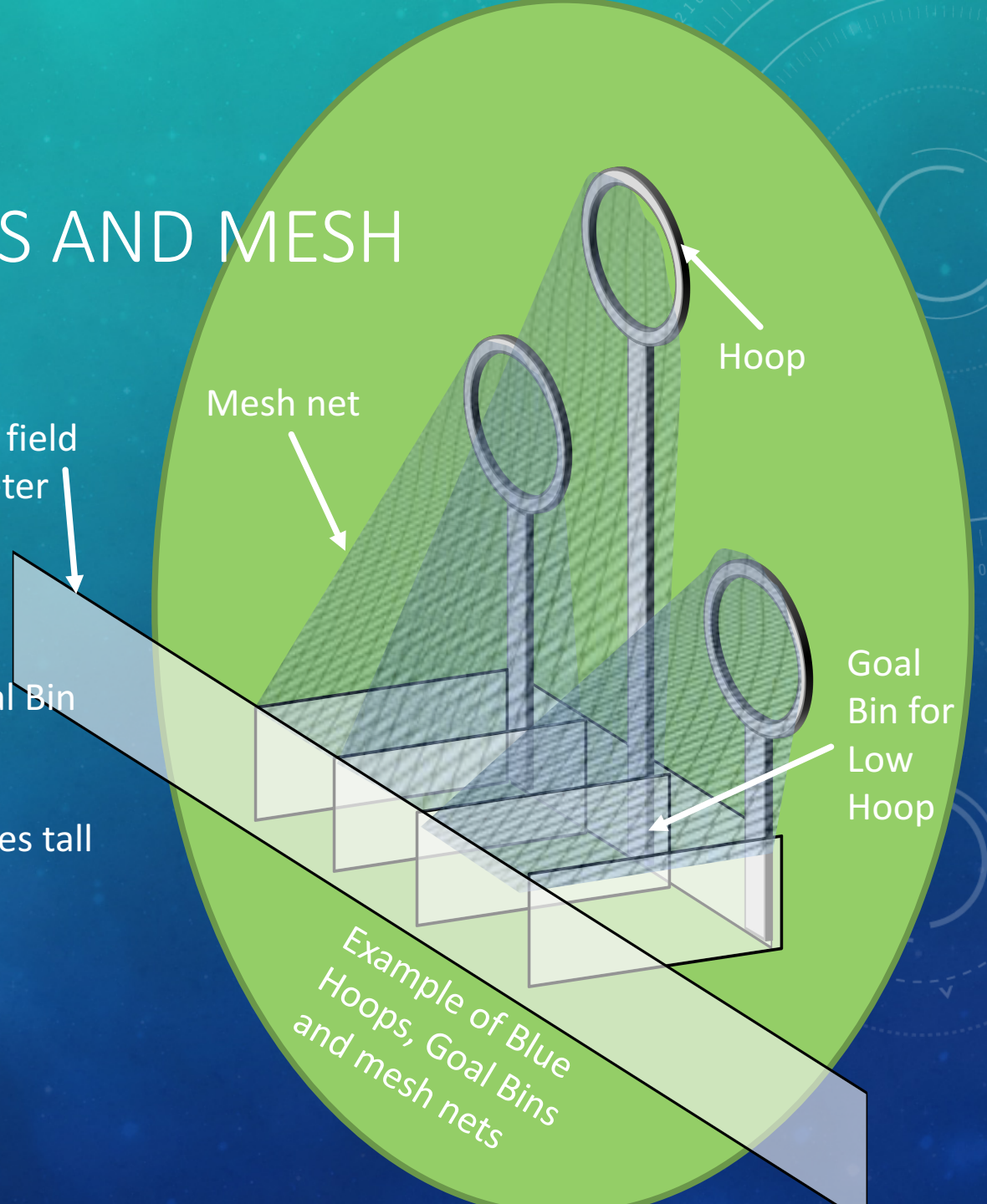
GAME DEFINITIONS: HOOPS

- 3 sturdy plastic gray Hoops, each at the top of a 2 inch PVC pole
- Each Hoop is 1 foot in diameter
- The width of the Hoop is 1.2 inches
- Elevation of bottom of Low Hoop is 2 feet. Each Tetra through this Hoop scores 2 points.
- Elevation of bottom of Medium Hoop is 3 feet. Each Tetra through this Hoop scores 3 points.
- Elevation of bottom of High Hoop is 4 feet. Each Tetras through this Hoop scores 5 points.



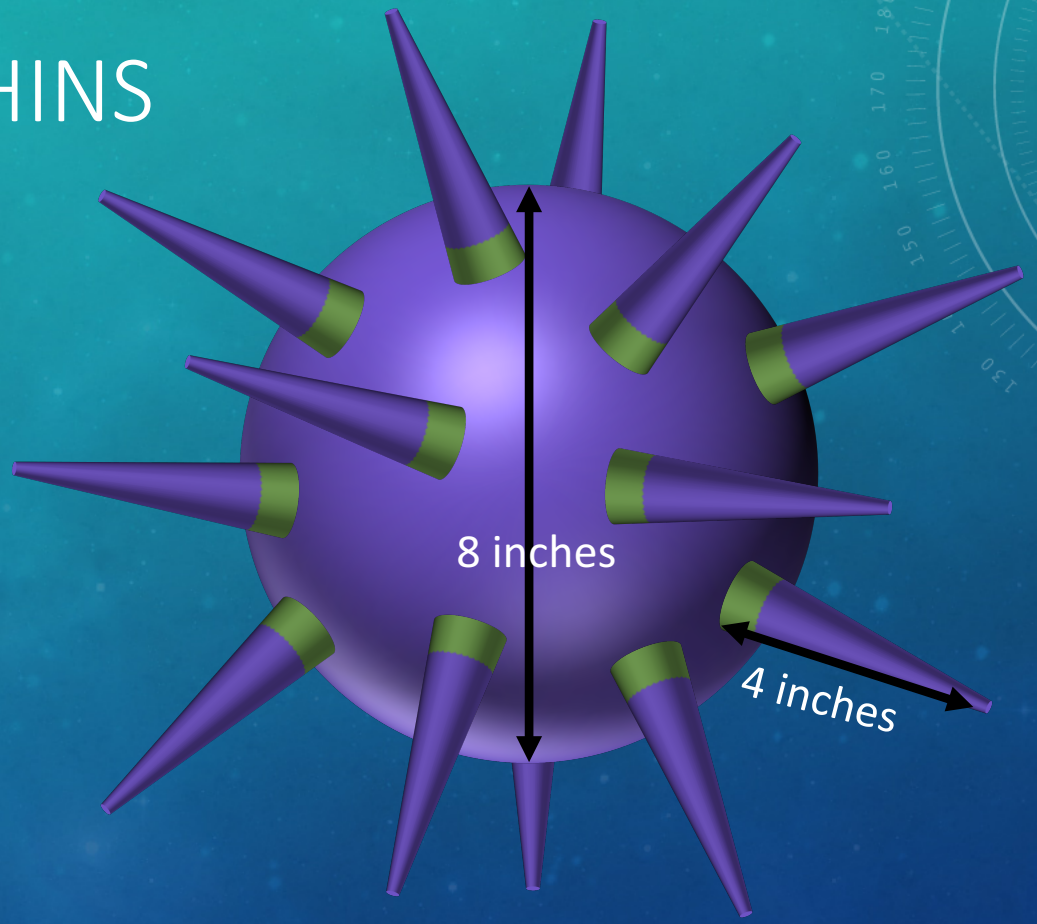
GOAL DEFINITIONS: GOAL BINS AND MESH

- Goal Bins are made of sheet metal and lexan
- Goal Bins are located behind each hoop
- A Mesh Net travels from each Hoop to its respective Goal Bin
- Each Hoop has it’s own Goal Bin
- The Goal Bins are 2 feet long by 1.5 feet wide and 6 inches tall



GAME DEFINITIONS: URCHINS

- 2 purple plastic spiky balls placed on the field
- 16 inches total diameter
- Each Urchin has thirteen 4 inch spikes
- 8 inch body diameter
- Only used in the last minute for Hanging



GAME DEFINITIONS: HANGING

- During the last minute of the game a robot may cross the fence and Hang on the High Hoop on the opposite side of the field from them.
- For the Hang to count, the bottom of the robot must be above the top of the Low Hoop. No part of the robot may be supported by the field perimeter or by the ground. Worth 20 points.
- A Hang with one (1) Urchin (Urchin MUST be touching the robot and the robot MUST fit within the definition of the Hang) is worth 30 points. (10 points for the Urchin, 20 for the Hang.)
- A Hang with two (2) Urchins (Urchins MUST be touching the robot and the robot MUST fit within the definition of the Hang) is worth 40 points. (20 points for the Urchins, 20 for the Hang.)
- During the Hang an Urchin may not touch the ground or field perimeter. If they do, the entire Hang does not count.
- An alliance may only hang once.

SECTION 2: OBSTACLES AND DEFENSE

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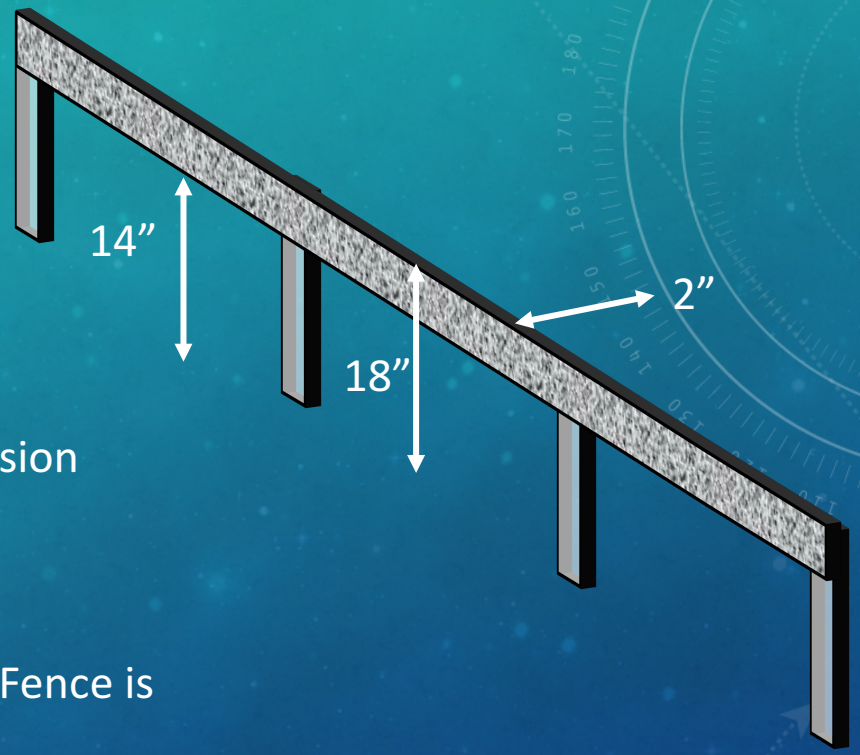
THE FENCE



- A 14 inch high – from ground to the bottom of the Fence – extrusion structure made of PVC foam.
- The Fence is located in the middle of the field.
- Height of the Fence is 4 inches; therefore the total height of the Fence is 18 inches from the field
- Fence is 2 inches thick

DEFENSE

Robots may:

- Steal Urchins
- Block shots
- Block Hangs

Please note: If the red alliance wants to score for the Blue alliance they may do so, and vice a versa. But there is no stealing of Tetras of different colors from the alliance. Red will not pick up and score blue, Blue will not pick up and score Red..

DEFENSE PART 2

Robots may NOT:

- Pin other robots
- Throw objects outside of the field (on purpose)
- Break or damage field elements
- Break or damage robots

SECTION 3: TIME AND CONSTRAINTS

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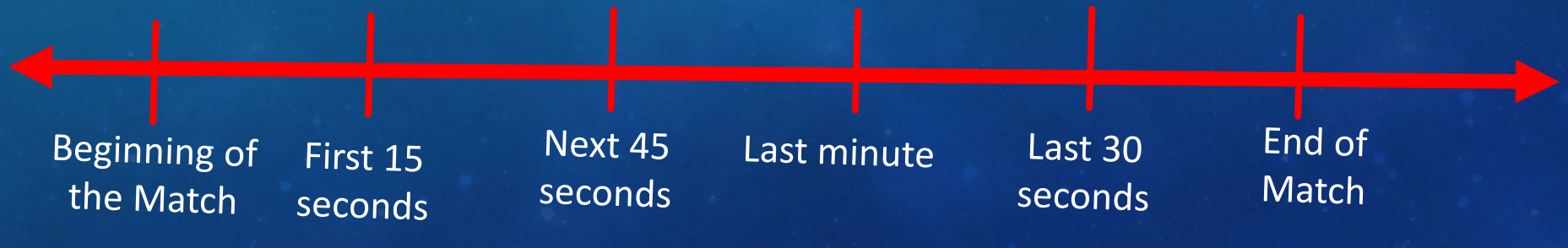
TIME AND CONSTRAINTS

- At the beginning of the match each robot must be no larger than 18x18x18 inches. After the match starts robots may expand or shrink.
- At the beginning of each match, each robot must be on it's starting tile. The robot may not touch any of the gray tiles.
- The first 15 seconds of the match is the Autonomous Period. Robots may not cross the fence.
- The next 45 seconds (not including the 15 for autonomous) robots may not cross the fence.
- During the last 1 minute of the match robots may cross the fence. After crossing they may hang on the high hoop for 20 points. If they carry an Urchin with them that adds another 10 points. 2 Urchins means 20 more points.



AUTONOMOUS

- 15 seconds
- Alliance with the most point at the end of the autonomous period will win the 15 point autonomous bonus.
- You can shoot over the Fence
- You can collect Tetras
- You can collect Urchins
- You may play defense

YOUR SIDE TIME

- 45 seconds
- You and your alliance partners must stay on your side of the fence
- You can shoot over the Fence
- You can collect Tetras
- You can collect Urchins
- You may play defense

LAST MINUTE CROSS

- 1 minute
- You may cross sides of the fence
- You may shoot Tetras up close
- You may Hang
- You may Hang with Urchin(s)
- You may shoot Tetras over Fence
- You may play defense

SECTION 4: SET UP

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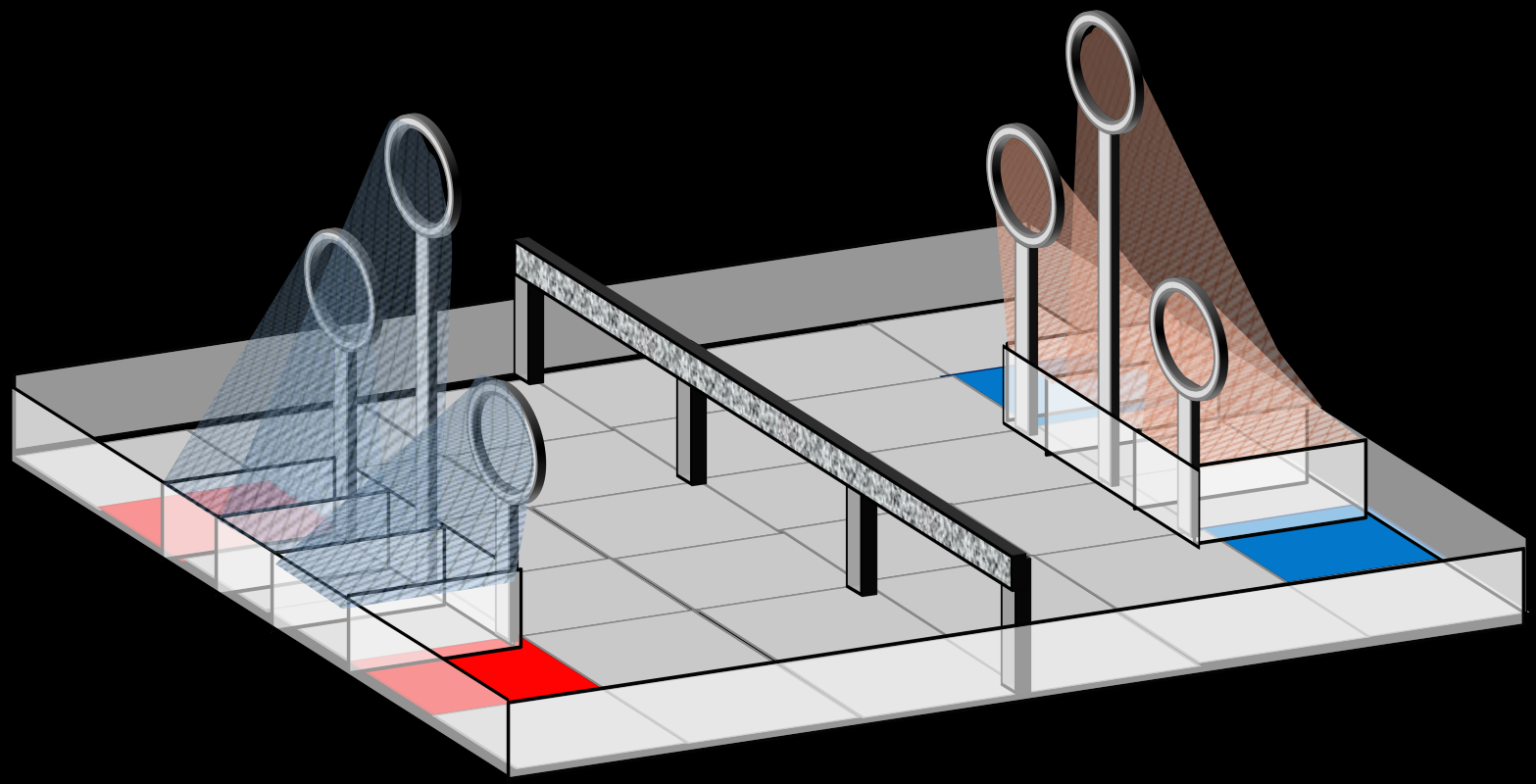
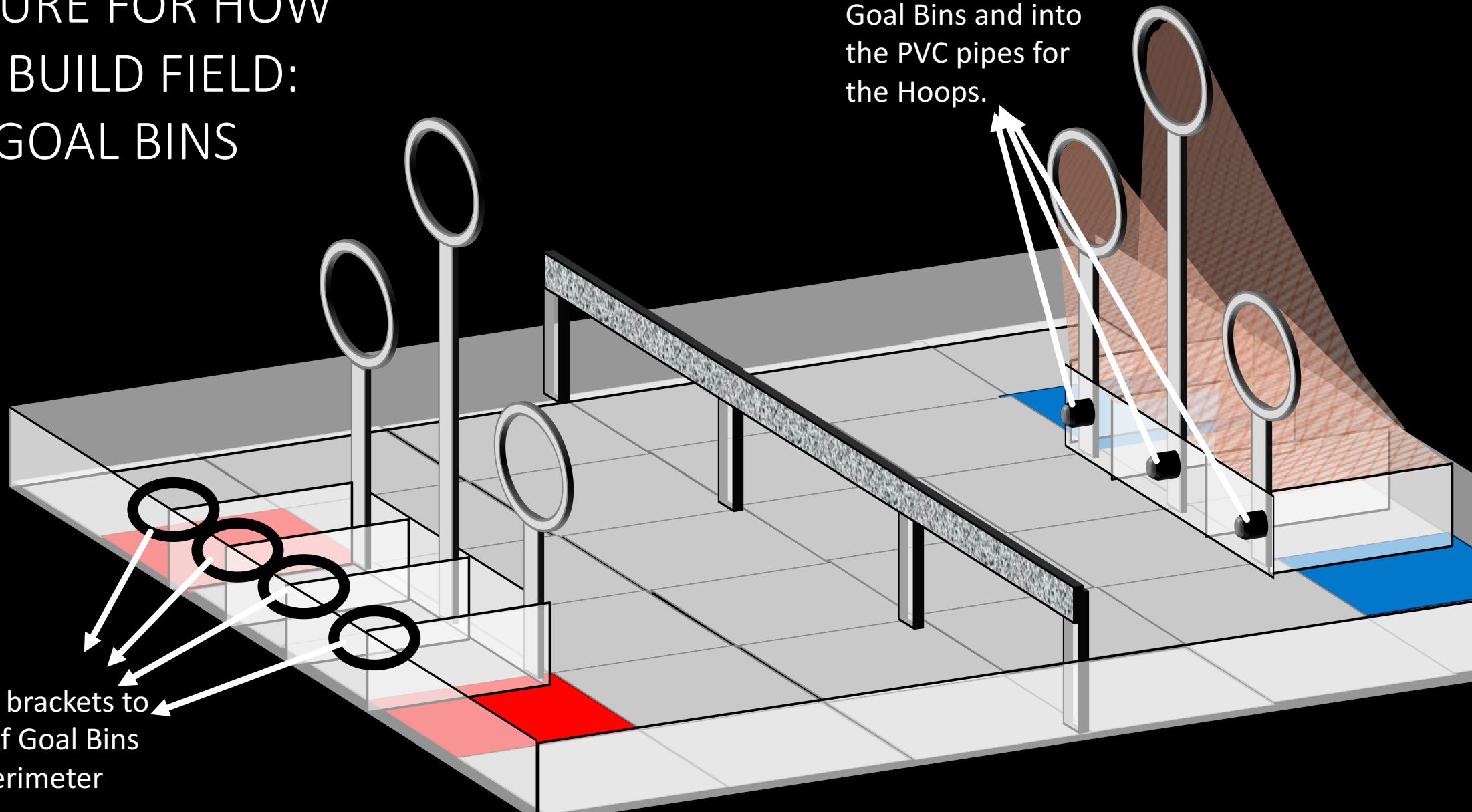
SETTING UP THE FIELD

- Set up is easy and quick
- Put together the foam tiles of the field.
  - While putting these together notice the 3 tiles in-between the the starting tiles have circular holes cut in them. Place the flat piece of sheet metal with the Hoop insert nub– To keep the hoops up-right – under and tiles so the holder pokes out of the hole. This will be done a total of 6 times for each of the 3 Hoops for the 2 Alliances
  - The 2 tiles with places to insert screw should be placed in the middle of the field for the fence.
- Twist the PVC pipe into the sheet metal holder
- Screw together the field perimeter.
- The 3 Goal Bins behind the 3 Hoops consist of 6 pieces of sheet metal and levan – there are a total of 12 pieces for the goals. 6 for each side – that fit in between the Hoops and field perimeter. Please see picture for how to screw them in.
- The mesh net is clipped around the top ring of the and to 3 sides of the goal bins. The clips are plastic.
- The 2 outer Fence posts are screwed into the side of the field perimeter. Screw the 2 inner Fence posts onto the field. Screw the Fence to the outer posts, then onto the inner posts.
- Place Tetras and Urchins on the field according to earlier illustrations.
- Done!

PICTURE FOR HOW TO BUILD FIELD:



PICTURE FOR HOW TO BUILD FIELD: GOAL BINS



PICTURE FOR HOW TO BUILD FIELD:

Plastic clips clip on the net. These clips are around the edges of the Hoops and the edges of each Goal Bin. To clip the net in place, simply open the clip, sandwich the net in-between the parts of the clip, then close the clip.