Table of Contents

Game Analysis [MM/DD]

Category	Game Analysis · Identify The Problem
Ready	☐
Exported	☐
Archive	☐

Identifies the game and robot design challenges in detail at the start of each design process cycle with words and pictures. States the goals for accomplishing the challenge.

Game Overview

VEX Robotics Competition Over Under is played on a 12’x12’ square field. In Head-to-Head Matches, two Alliances (red and blue) with two Teams each compete in a 15-second Autonomous Period followed by a 1:45 Driver Controlled Period. The goal is to score more Triballs in Goals and Elevate at the Match end. An Autonomous Win Point is awarded for completing three assigned tasks. Robot Skills Matches involve one Robot scoring points independently for 1 minute.

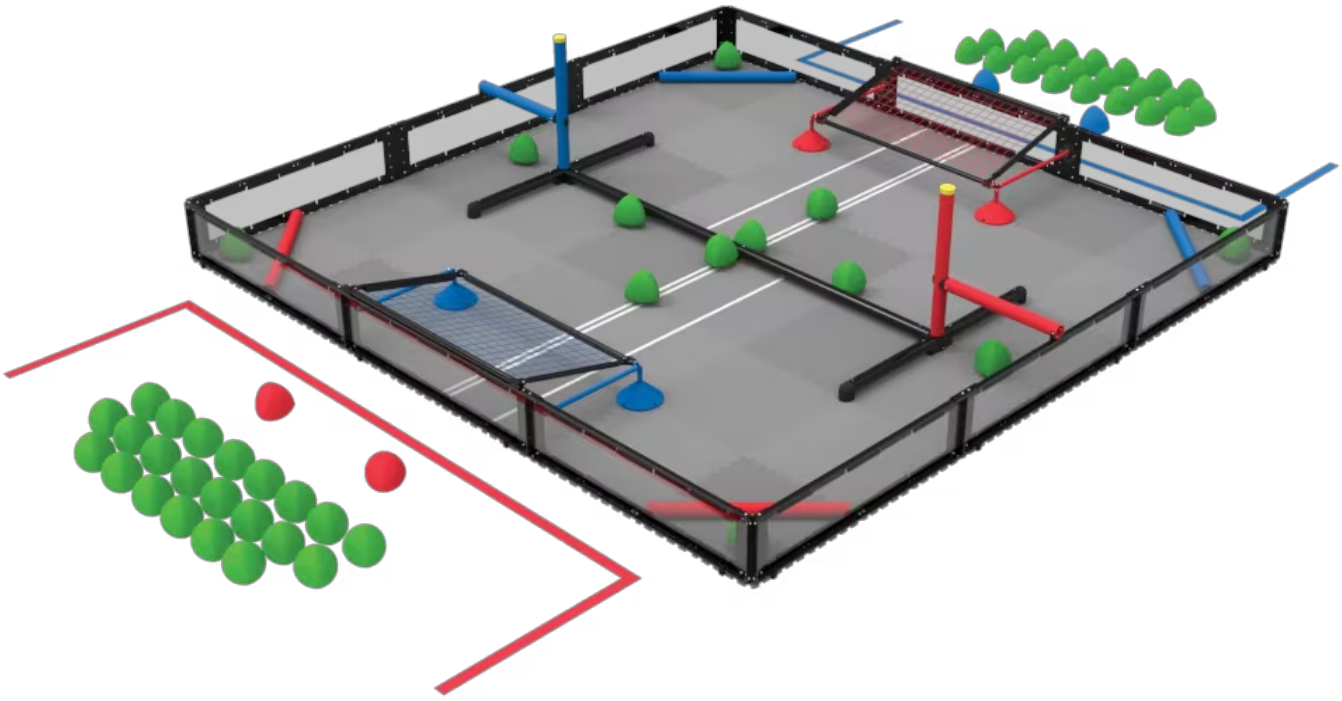

Figure 1 [Isometric Field View]

Game Objectives

- [Objective 1]
- [Objective 2]
- [Objective 3]
- [Add additional objectives]

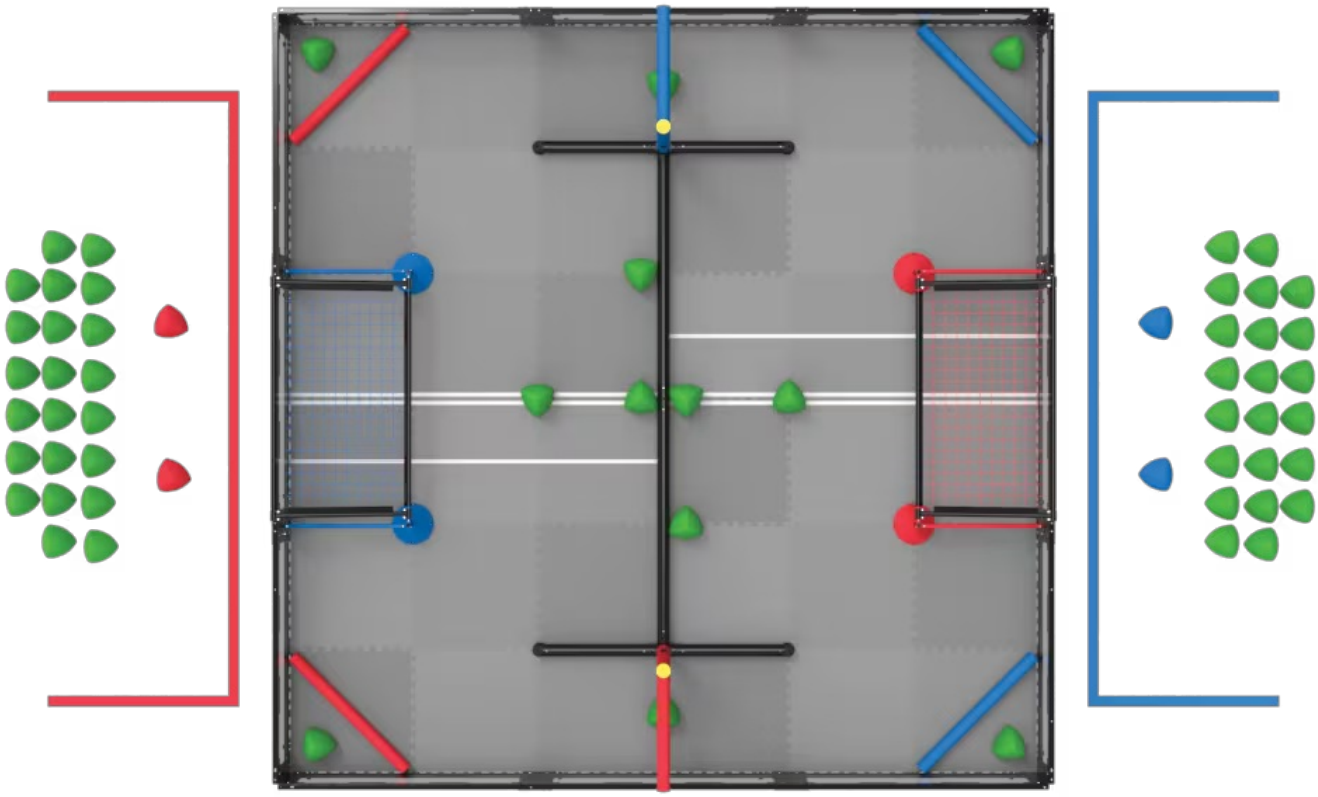

Figure 2 [Top Down Field View]

On any given field for [game name], there are:

- [total number] [primary game element]
  - [number] [game element] start on the field
  - [number] [game element] start as match loads
  - [number per alliance] colored [game element] for each alliance
- [number] [goals for game elements] for each alliance
- [number] [match load zones] for each alliance
- [number] [important field element] for each alliance
- A [object name] bisecting the field

At the beginning of a match, robots will start [describe starting position]

Game Element Breakdown

Figure 3 [Primary Game Element]

A [primary **game** element] has the following properties:

- [Describe its color]
  - [Explain why this might be significant]
- [Describe its shape]
  - [Explain why this might be significant]
- [Describe its material and texture]
  - [Explain why this might be significant]
- [Describe its size]
  - [Explain why this might be significant]
- [Describe its weight]
  - [Explain why this might be significant]

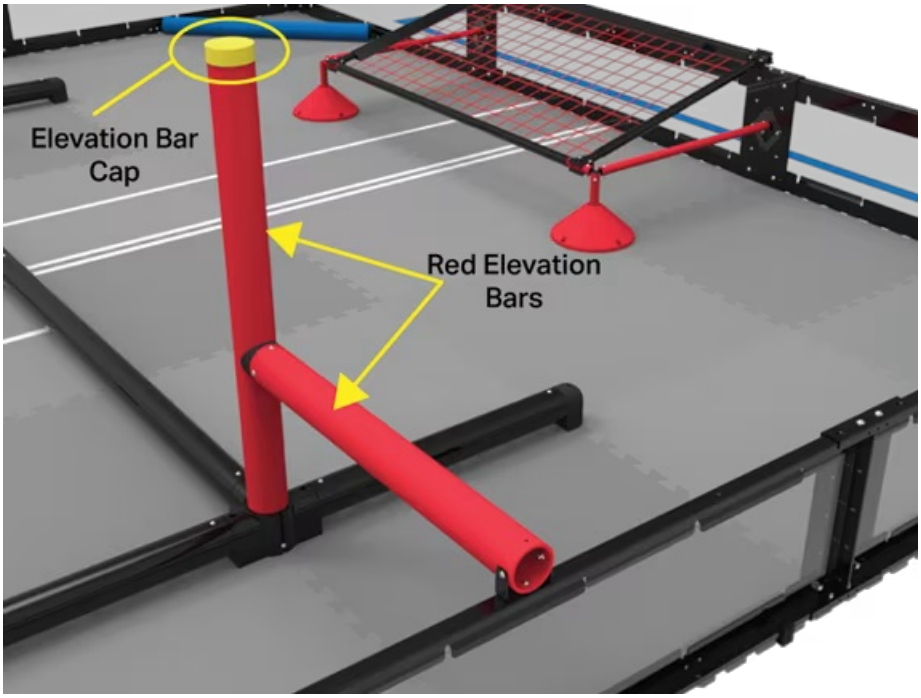

Figure 4 [Primary Field Element]

A [primary **field** element] has the following properties:

- [Describe its color]
  - [Explain why this might be significant]
- [Describe its shape]
  - [Explain why this might be significant]
- [Describe its material and texture]
  - [Explain why this might be significant]
- [Describe its size]

    - [Explain why this might be significant]
- [Describe its weight]
    - [Explain why this might be significant]

Scoring Breakdown

Points are scored by an alliance when the following occurs:

- A [primary game element] is placed in…
    - [High scoring location]
    - [Lower scoring location]
- A robot [present-tense verb to describe endgame] on a [relevant field element]
- The alliance wins the autonomous bonus
- A robot does [end game scoring component] at the end of the match

	Object Point Value	Total Object Amount	Maximum Points Possible	Percentage of Possible Points
[Game Element] in [High Scoring Location]				
[Game Element] in [Low Scoring Location]				
Robot [endgame present-tense verb]				
Autonomous Bonus				
Total			348	100%

Figure 3: Table relating point value to object amount for each game element.

[Explain your takeaways in bullet points about what objectives will be important to pursue based on the point totals, as well as what is less important but still should be considered]

Important Rules to Consider

[In bullet points, list out the most important, gameplay-affecting rules and how it eventually affects the robot's design]

Potential Strategies

Strategy 1 - [Key Term(ex. "Offensive")]

- [Strategy 1 in one sentence]
    - [Explain further]
- [Strategy 2 in one sentence]
    - [Explain further]
- [Strategy 3 in one sentence]
    - [Explain further]

Identify The Problem [MM/DD]

Category	Identify The Problem
Ready	☐
Exported	☐
Archive	☐

🆎
Used at the beginning of EVERY design cycle

🆎
Identifies the game and robot design challenges in detail at the start of each design process cycle with words and pictures. States the goals for accomplishing the challenge.

Problem Statement

[Explain what you expected/want to happen and what is currently happening]

Design Statement

[Explain your goals for the design and how you plan to get there. What do you want the outcome to be? What do you plan to do for this to happen?]

Constraints

[In bullet points, list out the important rules that this robot must follow, such as sizing restrictions or material usage. If a small component is being designed, show images of where you are designing to fit into or how it will interact with other components / game elements.]

Criteria

[What should the robot be able to do in relation to the problem statement when it is done?]

Important Deadlines

- [Milestone 1 Date]: [what needs to be done by milestone 1]
- [Next Tournament/Scrimmage Date]: [Tournament/Scrimmage Name]

Brainstorm Solution [MM/DD]

Category	Brainstorm Solution
Ready	☐
Exported	☐
Archive	☐

🅰️🅰️
Lists three or more possible solutions to the challenge with labeled diagrams. Citations provided for ideas that came from outside sources such as online videos or other teams.

Problem

[Define briefly problem that the component needs to solve]

The ideal [component name] should be able to:

- [Describe Criteria 1]
- [Describe Criteria 2]
- [Describe Criteria 3]

Potential Solutions

[Include CAD render or sketch of solution 1]

- [Solution 1 name]
  - [Describe Solution 1 in one or two sentences]
  - [Describe how Solution 1 fits into the larger robot/strategy in one or two sentences]

Supporting Data

[Include relevant, cited information about each solution, or include a table displaying test data for each solution]

Select Best Approach & Plan [MM/DD]

Category	Plan Select Best Solution
Ready	☐
Exported	☐
Archive	☐

🅰️🅰️
This should follow a brainstorming/prototyping entry

🅰️🅰️
Explains why the solution was selected through testing and/or a decision matrix. Fully describes the plan to implement the solution.

Problem

[In 1 sentence, restate the problem being solved]

Potential Solutions

[Include CAD render or sketch of solution 1]

- [Solution 1 name]

Decision Matrix

There are [number of criteria, at least three] criteria that will be used to determine which [component name] implementation is best:

- [Criteria 1] - [what the criteria means, what the numerical scale is]
- [Criteria 2] - [what the criteria means, what the numerical scale is]
- [Criteria 3] - [what the criteria means, what the numerical scale is]

	[Criteria 1]	[Criteria 2]	[Criteria 3]	Total
[Solution 1]				
[Solution 2]				
[Solution 3]				

[Explain why the selected solution will best solve the problem. Explain the weaknesses of the solutions not selected.]

Justification

The [chosen solution name] will be best because:

- [Justification based on decision matrix or supporting data]
- [Justification based on decision matrix or supporting data]
- [Justification based on decision matrix or supporting data]

Implementation Plan

[Explain vaguely how this new component will be added to the robot. Will further refinement be needed? Is there more testing to be done?]

Build Log [MM/DD]

Category	Build Log
Ready	☐
Exported	☐
Archive	☐

🆎
Records the steps to build and program the solution. Includes enough detail that the reader can follow the logic used by the team to develop their robot design, as well as recreate the robot design from the documentation.

Goals

- [List goals of the build. What problem is this solving]
- [Give a timeline for this build]

Sketches

[Include sketches of the component]

[Describe the intended use]

Prototypes

[Include photos of prototypes and refined sketches. Include testing data if possible]

Outcome

[Include images of the completed component or what was completed this day.]

Next Steps

[Explain what needs to be done next. Does the component still need to be finished? Does testing need to be done? What component needs to be built/designed next?]

Programming Log [MM/DD]

Category	Programming Log
Ready	☐
Exported	☐
Archive	☐

Records the steps to build and program the solution. Includes enough detail that the reader can follow the logic used by the team to develop their robot design, as well as recreate the robot design from the documentation.

Goals

- [List goals of the program. What problem is this solving]
- [Give a timeline for this program development]

Outline

[Include sketches of the logic. Include maps of buttons for driver control or paths for autonomous]

[Describe the intended use]

Prototypes

[Include code snippets of progress. COMMENT YOUR CODE]

```
//drive function
pros::motor(1)
```

Outcome

[Include images of the completed component or what was completed this day.]

Next Steps

[Explain what needs to be done next. Does the component still need to be finished? Does testing need to be done? What component needs to be built/designed next?]

Testing Solution [MM/DD]

Category	Testing
Ready	☐
Exported	☐
Archive	☐

🆎
Records All steps to test the solution, including test results.

Component Overview

[Include images of what is being tested. Explain the component and why it needs to be tested]

Testing Plan

[Describe how the component will be tested. Include pictures and sketches]

Testing

	[Attempt 1]	[Attempt 2]	[Attempt 3]	[Attempt 4]	[Attempt 5]
[Measurement 1]					
[Measurement 2]					

[Show results of tests. Include tables and graphs as needed]

Outcome & Next Steps

[What was learned from the testing]

[How does this testing help with the design process and what has to happen next?]

Tournament Recap [MM/DD]

Category	Testing Tournament Recap
Ready	☐
Exported	☐
Archive	☐

🆎
Records all the steps to test the solution, including test results

🆎
Tournaments and Scrimmages are one of the best ways to test a robot. Even if it is just an internal club scrimmage, lots can be learned and this should be documented. Watching other tournaments (like Signature Events) are also great for research and should be documented in a similar format.

Premise

[Include a captioned image from the tournament]

On [full date], we attended [name of the tournament] in [City, State] which had a total of [number of teams] competing.

Performance

Matches

Rank	1	Record	W-L-T
WP	#	CCWM	#
AP	#	OPR	#
SP	#	DPR	#

Outcome: [e.g. eliminated in quarterfinals, tournament champions, finalists, etc.]

Robot Skills Challenge

Rank	1	Total Score	#
Driver Score	#	Programming Score	#
Driver Attempts	#	Programming Attempts	#

[Explain briefly in 2-3 sentences how the skills score progressed throughout the tournament, such as if the driver/autonomous routine improved or got worse]

Subsystems

Subsystem 1

[Explain how subsystem 1 performed, describe any issues]

Takeaways

- Match Strategy:
  - [Strategic Takeaway 1]
- Robot Skills Challenge:
  - [Skills Takeaway 1]
- Subsystems:
  - [Change 1]

Next Steps

[Summarize what was learned and what needs to be done next]

Innovative Feature

Category	Innovation
Ready	☐
Exported	☐
Archive	☐

⚠
This is not the official submission form. Teams must use the form linked below as the LAST ENTRY in the engineering design notebook as well as the submission on Robot Events

https://kb.roboticseducation.org/hc/en-us/articles/4912455338391-Guide-to-Judging-Awards#innovate-award-bznnx

Innovate Award Submission Form

https://kb.roboticseducation.org/hc/en-us/articles/17319258476439

Brief Description of the novel aspect of the team's design being submitted:

[In 3-5 sentences, describe the most unique portion of the robot]

Identify the page numbers and/or the section(s) where documentation of the development of this aspect can be found:

- PAGE # → Initial Problem identification
- PAGE # → Initial Sketches
- PAGE # → Prototypes
- PAGE # → Testing
- PAGE # → Design Overview

Build Log [MM/DD]

date	@12/21/2023
Category	Build Log
Authors	Max Johnson
Ready	☐
Exported	☐
Archive	☐

💯 Records the steps to build and program the solution. Includes enough detail that the reader can follow the logic used by the team to develop their robot design, as well as recreate the robot design from the documentation.

Goals

- blah blah bla
- [Give a timeline for this build]

Sketches

[Include sketches of the component]

[Describe the intended use]

Prototypes

[Include photos of prototypes and refined sketches. Include testing data if possible]

Outcome

fasdfa

fnibnfqknf

Next Steps

[Explain what needs to be done next. Does the component still need to be finished? Does testing need to be done? What component needs to be built/designed next?]