



# Galleons Galore Prototyping Challenge

Presented by FRC 6328 in partnership with FRC 8604

8604



ALPHA CENTAURI

6328

MECHANICAL  
ADVANTAGE

LITTLETON, MA



# Introduction

In this challenge, you will work in small teams to create prototypes for the FRC game designed by our friends at 8604! This challenge will involve the following:

- Reading the game challenge and picking which type of mechanism to prototype based on game tasks
- Create detailed concept sketches of at least 3 ideas for prototype
- Select one design to prototype
- Use materials & tools in shop to create a prototype of mechanism design
- Create testing setup for design
- Test design
- Record results and make design poster

# Game Challenge

- In Galleons Galore, two alliances of 3 robots face off to store TREASURE CHESTS on their MERCHANT SHIPS while denying the opposing team points by launching CANNONBALLS at their stacks of TREASURE CHESTS. At the end of a game, a hurricane will come through and robots must seek shelter by docking at their ISLAND for additional points. During the 15 second autonomous period, robots must follow pre-programmed instructions.  
Alliances score points by:
  - Moving past the initiation line
  - Storing TREASURE CHESTS on their MERCHANT SHIP (2x points)
- During the 15 second preparation period, drivers must take control of their robots.  
Alliances score points by:
  - Storing TREASURE CHESTS on their MERCHANT SHIP
- During the 2-minute tele-op, drivers must take control of their robots.  
Alliances score points by:
  - Storing TREASURE CHESTS on their MERCHANT SHIP
- Alliances deny points to the opposing alliance by:
  - Launching CANNONBALLS at the opposing alliance's TREASURE CHEST and knocking them over
- During the 30 second endgame period, robots score points by:
  - Storing TREASURE CHESTS on their MERCHANT SHIP
  - Docking safely at their ISLAND or parking on the SANDBAR
- The alliance with the highest score at the end of the match wins.

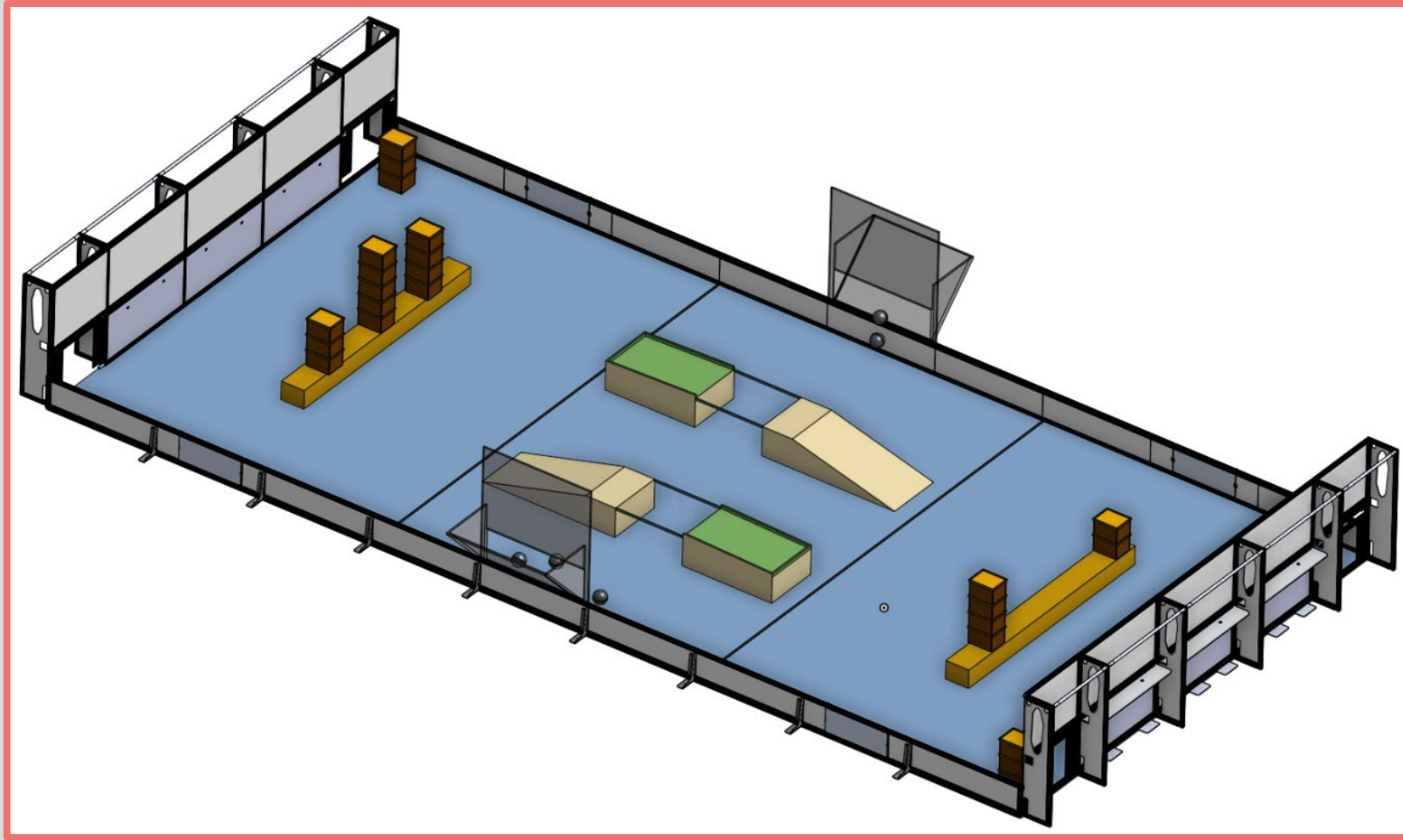
# Game Challenge

- **MERCHANT SHIP:** The MERCHANT SHIP is a platform that each alliance will store their TREASURE CHEST on. It is located near the alliance's driver stations wall and spans most of the width of the field. This will be made out of reinforced fiberglass to allow the boxes to slip easier.
- **ISLAND:** The ISLAND is a platform that robots can get on for additional points.
- **SANDBAR:** There is a sandbar that must be crossed before getting to the ISLAND. The SANDBAR is the ramp that leads to the ISLAND.
- **CANNONBALL PLAYER STATION:** There are 2 player stations located on both sides of the field. There are blue and red player stations, 1 going to each alliance and on the side nearest to the opposing side of the field and on the respective team's right side.
- **TREASURE CHEST PLAYER STATION:** There are 4 player stations located in the 4 corners of the field. There are blue and red player stations, 2 going to each alliance and on their respective side.
- **CHAIN:** Two CHAINS connect the SANDBAR to the ISLAND. Teams can use these CHAINS to go to the ISLAND, but it is not required. A metal 2-inch linkage chain will be used.

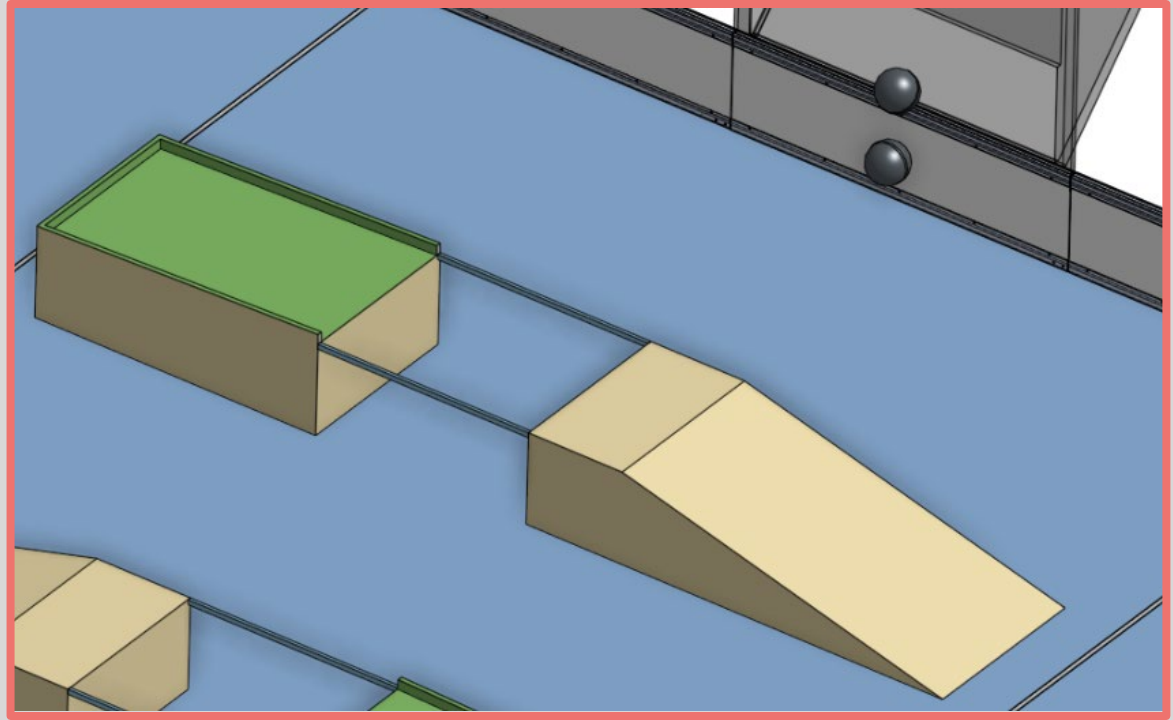
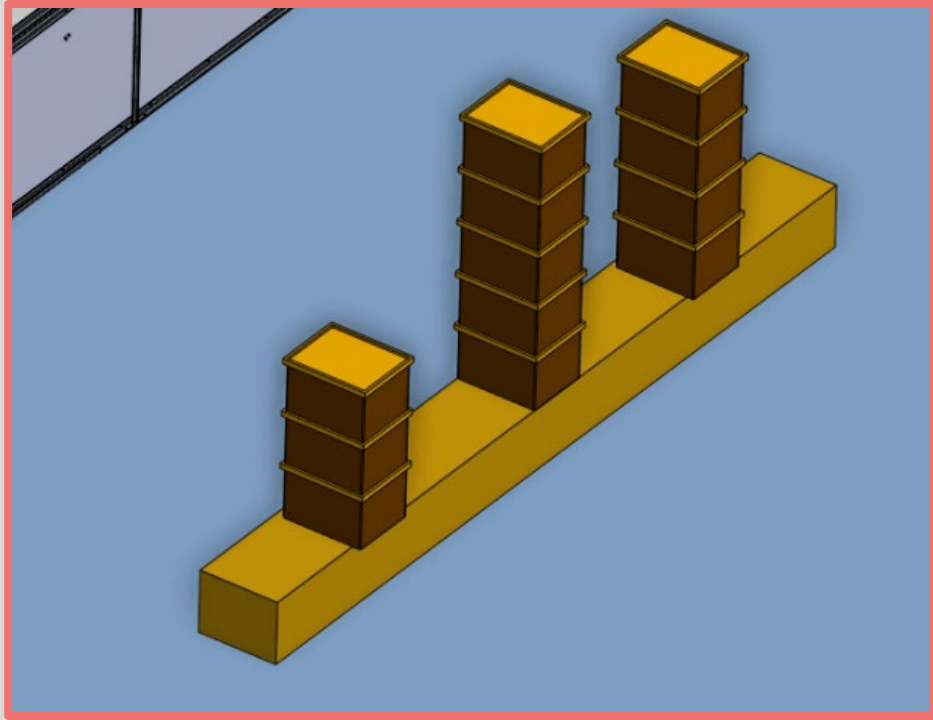
# Game Challenge

- **Auto (15 Seconds)**: During the autonomous period, alliances are tasked with moving past the initiation line such that the robot is fully past the initiation line. Alliances may score points by beginning to store TREASURE CHESTS on their respective MERCHANT SHIP. Points are doubled during this period. Preparation Period (15 Seconds): During the preparation period, drivers are allowed to take control of their robots and store TREASURE CHESTS on their respective MERCHANT SHIP. Alliances are not allowed to shoot CANNONBALLS at the opposing side.
- **Tele-op Period (130 Seconds)**: During the teleoperated period, alliances score points by continuing to store TREASURE CHESTS on their MERCHANT SHIPS. Alliances are allowed to deny points to the opposing alliance by shooting CANNONBALLS at the opposing alliances stack of TREASURE CHESTS to knock them off their MERCHANT SHIP. The last 30 seconds has doubled point values.
- **Endgame Period (30 Seconds)**: During the endgame period, the endgame is unlocked and alliances are allowed to dock at the ISLAND for additional points. Additionally, alliances can fully support themselves on the SANDBAR for less points. The point value for a TREASURE CHEST stored is doubled during this period.

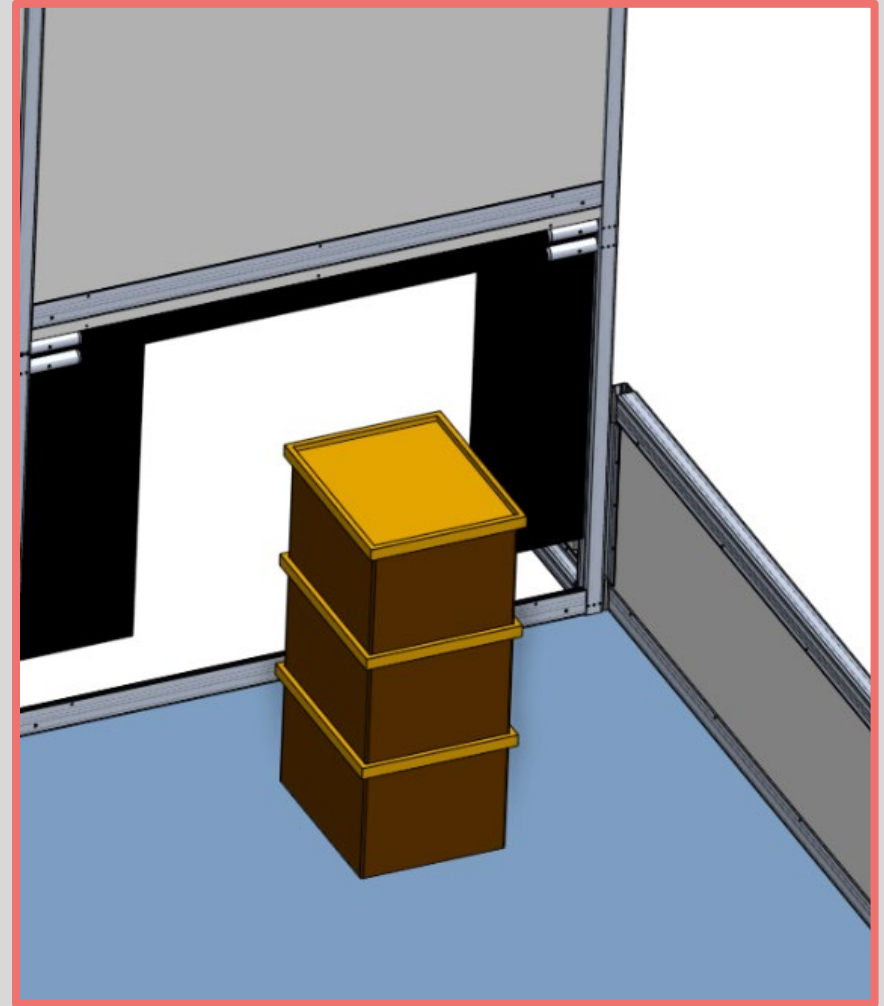
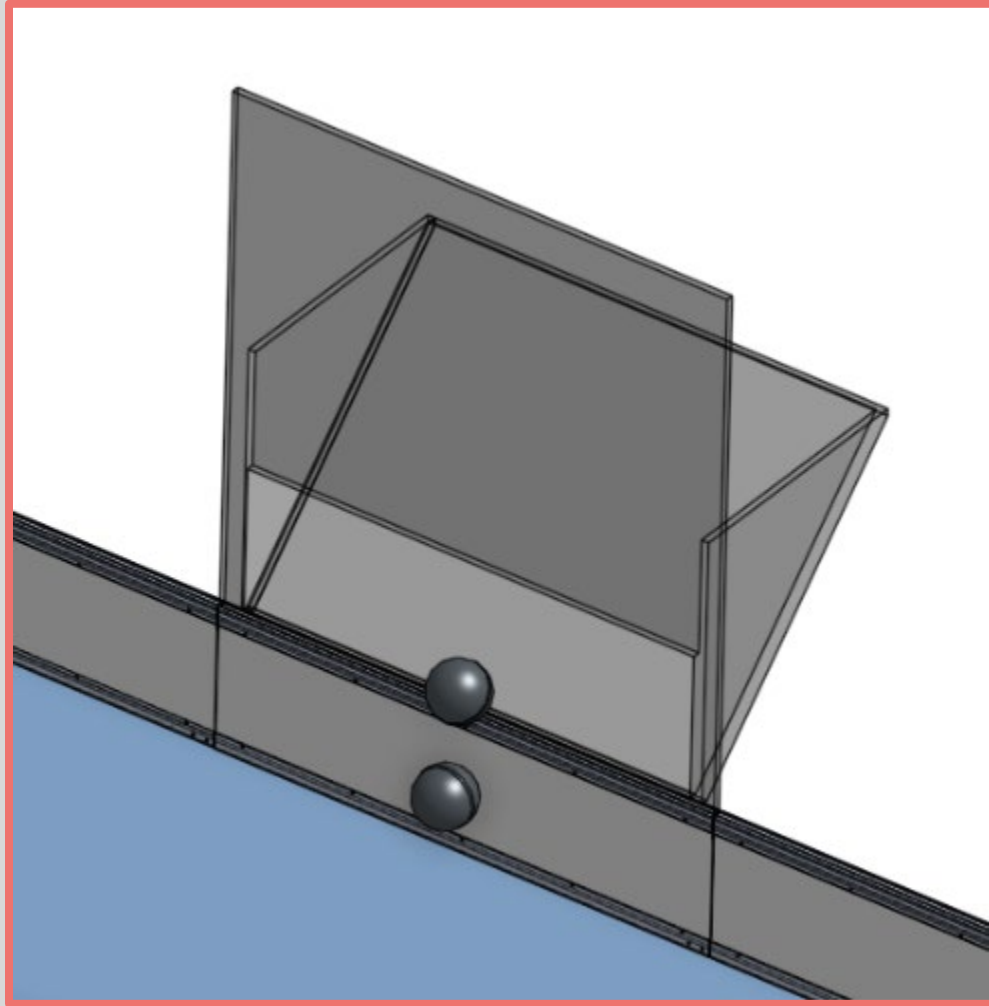
# Game Field



# Game Field



# Game Field





# Concept Sketches

1

Select one game challenge to prototype

- Collecting or stacking TREASURE CHESTS
- Collecting or shooting CANNONBALLS
- Driving onto SANDBAR or ISLAND

2

Generate at least three concept sketches of mechanisms you could use for your selected challenge

3

Before moving on to prototyping, have your sketches approved by instructor

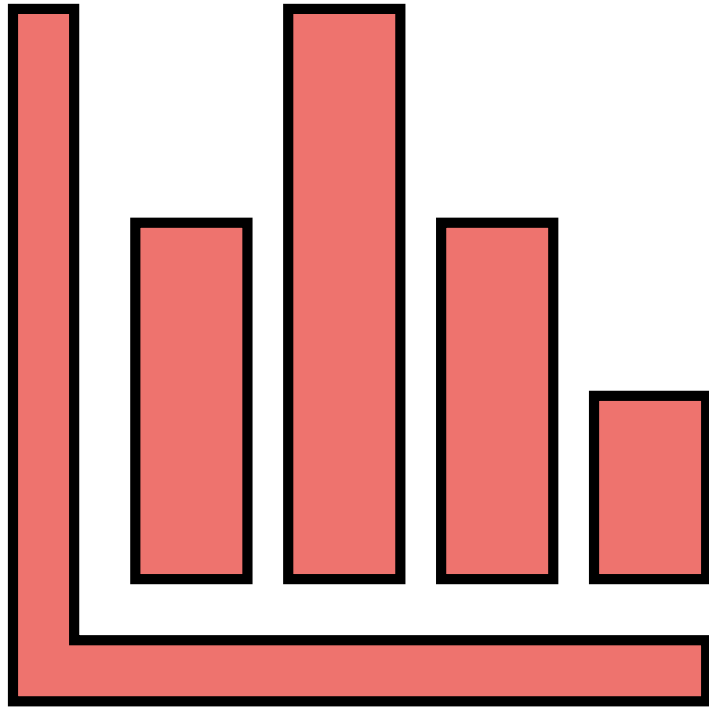


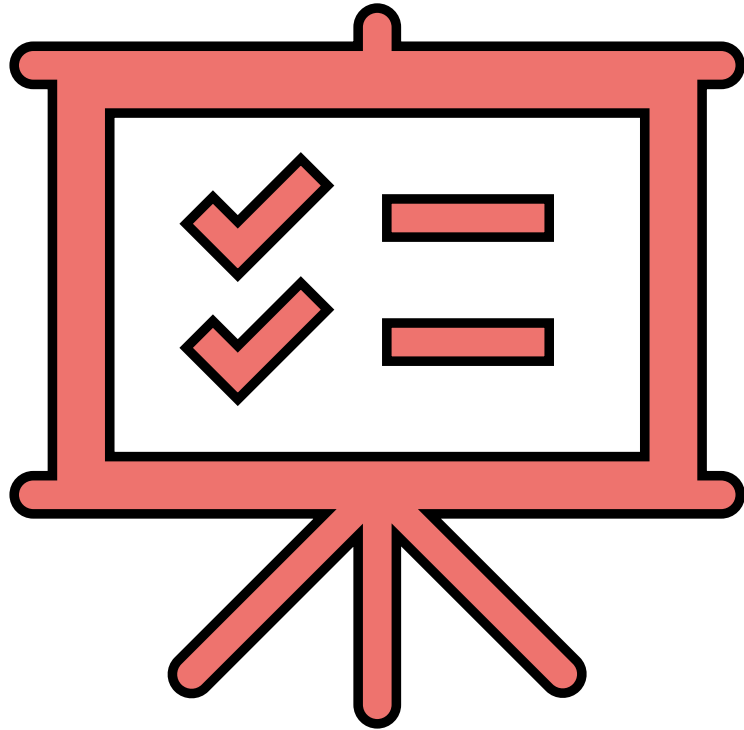
# Prototyping

- Use materials in class to create a prototype of your mechanism
- You can use hand tools, power tools, drills, 3D printers, poster board, wood, plastic, VEX pieces, LEGO pieces, etc. for your prototypes

# Testing

- Decide the kind of data you need to collect to test the effectiveness of your prototype
- Design an experimental procedure to test your prototype
- Have your procedure approved before proceeding
- Test the prototype and collect your data!





# Summarizing Results & Design Poster

- After you completed testing, design an 11x17 poster using the provided PPT template to summarize your prototype design and testing results
- Include pictures and an analysis of your testing data
  - Think about best ways to present the data – Bar chart? Tables? Scatter plot? Statistical calculations?

# BONUS POINTS!

- For an extra 10 bonus points, design a game logo for Galleons Galore!
- Here are some example game logos:

