

Trial and Error Robot Game Strategy for FLL

**#16461 Infinite Turtles
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Who Are We

Infinite Turtles:

- 2x North Carolina State Championship Inspire Award Winner
- 2022 World Championship Innovate Award Winner
- 2023 World Championship Division Inspire Award Finalist
- 5th year team

FIRST[®] TECH CHALLENGE



Sanjita and Avi

- Senior founding member of Turtles
- 2 years of FLL
- 7 years of FIRST
- Current co-captain
- New turtle member
- 2 years of FTC
- 3 years of FIRST



Agenda

Explaining the Robot Game

Ranking of Missions

General Tips

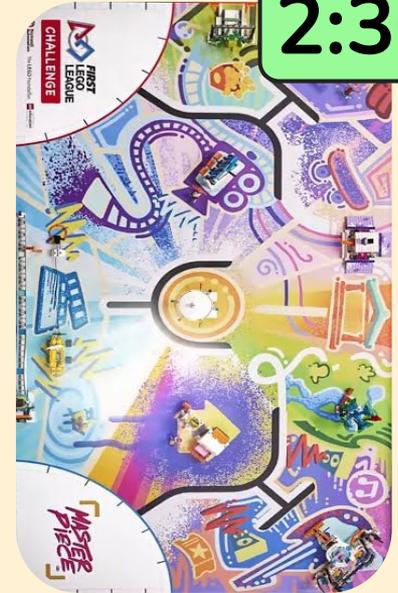
What is the Robot Game?

Competition: Robot Game Strategy

- 2.5 minutes to get the most points possible
- Some points are easier to get than others.... And those are the ones you want to get easily.

Masterpiece

This year's theme is all about art. The theme of FIRST LEGO League theme this year is Masterpiece and you can purchase the mat and the needed LEGO models from FIRST



2:30

Ranking Missions



Sorting the Missions

Couple of really big factors...

1. Potential Points
 2. Distance From Home/Launch Pad
 3. Difficulty
 4. Time
- **Remember that every mission has its pros and cons, it's up to you how much you can balance!**

You don't have to know all of this information at the very beginning, you can do your best to guess, or even try out some missions to get an idea.

Order of Missions

What takes the least amount of time?

What takes the least amount of time to set up?

What missions have the greatest amount of risk of failing?

Are there any obstacles that you may have to get around while getting to the mission?

For Difficult Missions

Important Questions & Considerations

- If the robot gets caught on a mission, do you take a penalty and pick it up immediately, or do you wait for time to run out?
- Is it a good idea to rerun the mission one more time, or to move on to the next mission?
- Whose mission is a “money maker”?
- Whose mission takes the longest to set up for?
(positioning, selecting the mission, and putting on attachments)

Ranking the Missions

Now that you've thought a bit about the complexity of each mission in terms of the four factors we discussed, it's time to rank them.

1. Prioritize high-value missions: Focus on missions that offer the most points to maximize your score. (high value missions = money makers)
2. Consider mission dependencies: Identify missions that can be completed together efficiently to save time.
3. Review mission descriptions: Understand the specific rules and objectives of each mission to avoid penalties

Points Per Second

What?

- Points Per Second was a unit that our team developed while we were in FLL that allowed us to judge the importance of a mission and figure out which missions would give us the most points.

How To Calculate

- Points per second is calculated by taking the REALISTIC amount of points that a mission earns divided by the TOTAL amount of seconds taken to run the mission (including the amount of time taken to set up)

How and What Do We Use This For?

- Allows us to make tough decisions during competition as well, such as running a mission again if it failed, or running other missions.

Realistic Amount of Pts =
Average number of points
gained from mission out of ten
runs

$\frac{\text{Realistic Amount of Points}}{\text{Total Amount of Time Taken}}$

= Points Earned Per Second

Your Requirements

Requirements

Put in certain requirements for your bot AND YOUR TEAM to reach during every full mission run.

Examples:

- Certain amount of points that your bot has to reach during a specific mission run,
- Amount of time that a mission operator took setting up and positioning

TIME EVERYTHING!!!!

Minimum Points / Maximum Points

- In every season, our team had an approximate minimum amount of points that we reached, based on the sort of guaranteed missions that we did.
- However, there were certain “money maker” missions that required a little more precision and were not as solid.

**REMEMBER, GRAB THE
LOW-HANGING FRUIT FIRST!**

General Tips



Consistency over Complexity!!!!

Strategy Adjustment

Post-Match Analysis

Documentation

Post Match Analysis

After your competition, you may want to make some changes to your attachments, code, and even to your entire robot. This will eventually affect your robot game strategy. This is why it is important to realize that this process is NOT A LINEAR process!

You must go back and test things to improve, and learn from your mistakes! Remember, TEST AND LEARN is not supposed to be easy, nor is it supposed to be nice and neat. It is a strategy to help YOU AND YOUR TEAM progress, and progress is always going to be messy.



Documentation!!!

You MUST remember to record everything in a notebook! Every change, every different thing that changed from version to version has to be recorded somewhere in order to document progress, and to figure out what works and what doesn't. Make sure to take pictures of every new version of attachments and new updates to the bot. This will help you in your Robot Design presentations to the judges, and will help you show them how far you have come this season! Pictures of whiteboards, engineering notebooks, and other documentation is also highly encouraged.

It is helpful to write what the team accomplished in each of the three categories at the end of each practice (Core Values, Robot, and Project). This way the team is aware of what is lacking, and what needs to be worked on. This is also a place where the team can assign homework for work that can be completed outside of the meetings.

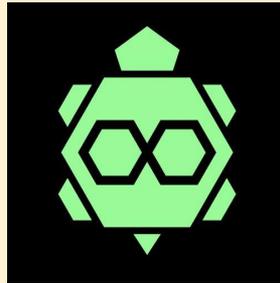


Contacts and Help

We are both from 16461, a team based in Southeast Charlotte, and are occasionally able to help in-person in the Charlotte Metro area.

We can be contacted with our emails at **sanjita@mcr.club** and **avi@mcr.club**, please CC a coach on your communications.
We can be contacted on discord **@sanjita**

This presentation and all other 16461 kickoff presentations can be found on 16461's website at <https://16461.mcr.club>



<https://16461.mcr.club>

<https://discord.gg/nEFb7X5BUR>