

How to Strategize and Plan to be Successful in Botball

Mauli Kinkhabwala

Dewitt Perry Middle School 1709

Beltline Road Carrollton, TX

75006 culpd@cfbisd.edu

972-968-4400

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1. Introduction

Botball is a great experience that teaches life skills and gives students the practice of working on real-life challenges with a team. It is a great program that encourages students to use science, engineering, technology, computer science, and math to build autonomous robots. In Botball, we also learn communication, leadership, teamwork, and project management. Every year KIPR comes up with a new game board with different components, each scoring different amounts of points. There are multiple ways to score, and there are countless strategies one can make to get those points. However, the big-scoring objects are always harder to acquire and move, while the objects that provide no challenge in acquiring score considerably fewer points. The robots that you build have to be able to hold and transport whatever objects you decide to get. These circumstances make it absolutely necessary to have a team strategy and a plan ready before starting to build the robots.

2. Start by Holding a Team Meeting

The best way to plan and strategize is together. My team got together this year even before Botball officially started and discussed all the rules of the game, point values for all the pieces, what pieces on the board we wanted to get, what was reasonable for our robots to get, and what was not reasonable to try for. Because everyone on our team is in middle school, we wanted our strategy to be somewhat “defensive.” By that, I mean that we don’t go for high scoring objects that would require building or programming skills too advanced for our age. We wanted a strategy that would give us a good number of points while being a challenge that is not beyond our level. Our robots had to be simple, reliable, and consistent.

We looked at the game, and eliminated the pieces that looked too difficult to get. Every member on our team got a chance to say what they were thinking the team should do. One person on the team was writing down all the ideas. We kept going around in a circle, everyone getting to say what was on their mind, until we had figured out what objects on the board we were going to go for. Then we decided what objects the LINK would get, what objects the Create would get, and what our overall strategy was going to be.

Throughout the meeting, it is very important to be recording all the information given and exchanged. Also, during the meeting your team should come up with a plan for what both of your robots are going to do. Try using a grid like this [Figure 1] to record your plans and stay organized. It is very simple but effective and easy to read for everyone.

Team Strategy	
Robot 1	Robot 2
Cube/Botguy- goes to the left, needs claw	Cube/Botguy- goes to the right, needs claw
Geodes- needs forklift	Poms- needs claw and basket

Figure 1

3. Start Planning and Think it Through

Once your team has come up with a strategy, it's time to start planning. First, our team divided into two groups- one for the LINK team, and the other for the Create team. Then we voted for the two team leaders of both groups. Next, we divided the two groups even more into programmers, builders, and documenters. Everyone on the team can help out in every area. It is not necessary that members have to stick to the job they were assigned to, or the documenters, programmers, and builders would have nothing to do at one point. The division is just important so kids who excel in one area of Botball can do more work there, but help out everywhere else and improve those areas as well. Finally, we assigned everyone in each team some pieces to find so that the parts kit could be made quickly, easily, and efficiently.

3.1 Planning the Basics

At the team meeting, we made a spreadsheet that had every team member's full name, address, phone number-home and cell, and their email address. The spreadsheet was sent to all the people in the group. That way if any team member needed to be notified of something, or their assistance was needed, everyone would know how to contact them.

After that we got together with our mentor, Mr. Culp, and discussed what days we would meet to work, and what time we would arrive. Then we went through the entire schedule of the year and noted any cancelled dates, and all the weekend dates. Mr. Culp put this schedule on his website, so the parents would know about all the important dates, too. This way the entire schedule was planned, and all the students and parents knew when the cancelled dates were. When they got a notice for no robotics, it would only be an extra reminder.

3.2 Planning the Robots

Once the basics are out of the way, the real work on the robots can start. Our team started by drawing the robot we were going to build on a dry-erase board. That way we could fix our sketch just as easily as we could add to it. We tried a few designs until we finally found a look that would work perfectly and look good. After we were sure we liked it, we all copied the image and made a rough sketch on a sheet of paper [Figure 2] [Figure 3] and kept that with ourselves. That way actually building the robot is much easier and planned out. We know what type of pieces we'll need, we know where to start, and we know where all the servos/motors will go. This planning will benefit everyone on the team, and it will get the robot built faster, so the programmers can have more time to perfect the code.

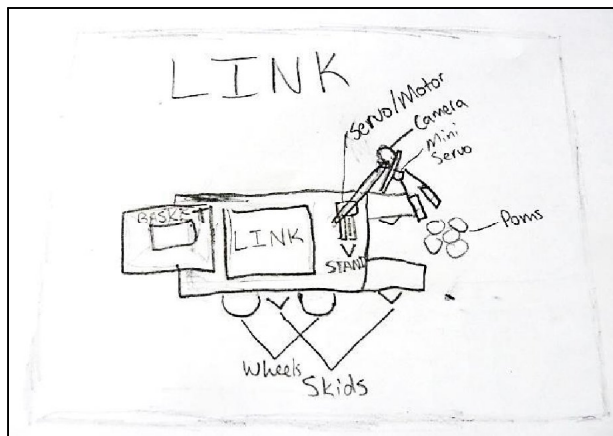


Figure 2: Picks up green poms for Seeding

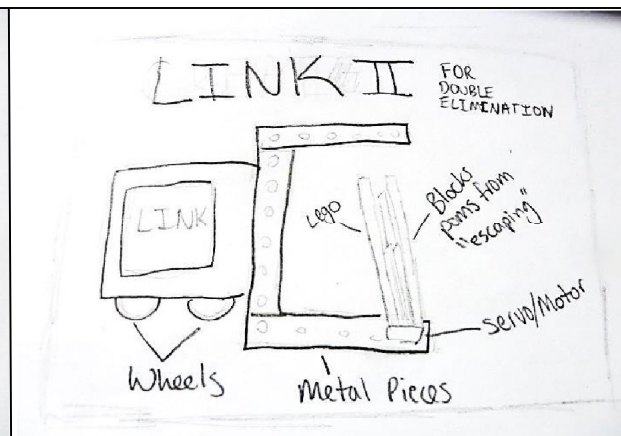


Figure 3: LINK for Double Elimination

4. Benefits of Strategizing and Planning

All these planning and strategizing we have done wasn't for nothing; it really has benefits in the long-term and in the short-term. Having a strategy is essential for success, because that is what the entire robots are based on. Your strategies may change, but the core of it will remain the same, and your robot will have all it needs to be able collect as many points as it can in two minutes or less. Your strategy is what the entire robot revolves around. If you have no strategy, you have no base, no core, no foundation, and everything falls apart.

Planning is no less important than making a strategy. Planning helps keep everything organized, separated, clean to look at, and easy to read. If everything is already planned ahead, then there is no stress because you already know what's going to happen. Everything is already thought out before, so there is no need to do it later. That saves time, and therefore creates extra time that can be put to use for more work. Planning once keeps everything running smoother because the schedule is already mapped out, and we know what the robot should look like from the start. It eases the burden off a lot of people, and helps others do more in the extra time created by planning ahead.

4.1 How Planning and Strategizing Really Help

Planning and strategizing help because they save a lot of time, and time is essential in Botball. With both of those, the entire Botball season is mapped out, and the entire team knows what the plan is, and what happens next. Builders know what the robot should look like, and programmers know what the robot should do. It relieves a lot of stress from the members, and helps everything run smoother. If all the team members can get together just once and plan out everything, and there would be no need to map it all out as we go. That would save a lot of time, and have people be on top of whatever they need to do. Without strategies the robot could not have been built right, and without planning everything would have been a disaster because it was not already prepared.

5. How Strategizing and Planning Benefitted My Team

Using all these planning and strategizing our team was much more organized, and remained well on task. All the members knew where everything was located, when and what all the important dates were, what the finished robots would look like, and what the robots would do even before they were made. This way all the team members were ahead of the game and they all knew what to do. Everyone on the team was divided into two groups for the two robots, and then further divided into three sections for builders, programmers, and documenters. That way the work was divided efficiently, and everyone was doing what they did best. The building and programming process went much faster and smoother because everything was planned out. Planning and strategizing together made all the members in our group work more as a team. Taking just a little time at the start of Botball season to go over the strategy and to plan everything out for the entire season can greatly benefit any team. This, I believe, is the first step to success.

5.1 How Our Hard Work Paid Off During the Regionals

During Regionals our team was organized, and we worked better as a group. All members did what they were best at, so the building procedure was done faster and we could spend more time perfecting the robots. Because of our planning, everything from the days we were meeting to the pieces in the kits was organized. We also set a fixed time period every meeting day to have one or two breaks (depending on how long we were there), and that way no one got off task.

Everyone on our team did exactly what they were supposed to do when they were supposed to do it. Our two robots, Nemo and Dori, were quickly built and programmed. Then we could spend more time adjusting and perfecting the program code to make both robots reliable and synchronized with each other. Our entire team worked very hard the entire Botball season making and perfecting Nemo and Dori, and I believe all the awards we got shows just how hard we worked.

During Regionals our team got...

1. Second place for Overall Winners
2. Third place for Double Elimination
3. Fourth place for Seeding Rounds
4. Outstanding Documentation
5. Judge's Choice- Outstanding Engineering
6. Judge's Choice- Robot Collaboration/ Synchronization

I think all that planning and strategizing really paid off for our team! We were really excited by the results and were ready to do just as well or better in GCER.

5.2 How Our Hard Work is Paying off During GCER

Since our team has already worked together during the Regionals, we are working even better as a team during GCER. At the start of GCER, we all came together and created a new strategy we were going to use that was better than our old strategy and would score us many more points than before. Instead of going for geodes, Botguy, the red cube, and all poms- orange and green like we did for the regionals, our new strategy had us trying to go for only the green poms (organic samples) and stacking the rocket boosters onto the tallest launch pad. After that, we did all the planning we had done before, created the kits, and sketched the different robot designs. This made us much more organized and prepared so all the work could go on more efficiently and more swiftly. Everyone already knew each other's strength and weaknesses, and that made us a stronger, better team. We quickly divided into three groups with two or no sub-teams in each group. One group (two sub-teams) worked on fixing and improving our robots, Nemo and Dori, from the Regionals. The second group with no sub teams worked on making a LINK robot only for Double Elimination [Figure 3- above]. The last team (two sub-teams) worked on making the two new robots, Link and Zelda, for GCER. They both were a little advanced for middle-schoolers because one robot was sorting and the other robot was stacking. That was why we had fixed and improved the old robots- just in case the new robots did not function well. Right now work on our robots for GCER is going smoothly, and it's all because we strategized and planned!

6. Conclusion

Botball is a program that needs you to learn how to build robots and be able to program them, but more than that, it requires you to be able to work together with others in a team. The best way to do that is by planning and strategizing. It really makes life a whole lot easier, and makes everything more organized. Even a simple checklist for any purpose can do wonders. If a

workspace is cluttered and messy, then it becomes hard and frustrating to for in that state. But if the same workspace is neat and organized, then working there will be much easier and maybe even fun. The same way having everything from what all the team members will be doing to having an arrange parts kit can really help your team do better.

Being in robotics and participating in Botball for two years has been a great experience for me. I have learned so much about lots of things that will help me greatly in the future. This year is the first time I am going to a Global Conference and I am very excited. Out team has worked very hard and has done very well all because of planning and strategizing. I believe that we are going to do great this year at GCER, and we are going to come home with lots of more knowledge and friends.