

To whom it may concern:

Hello! We are FRC Team 11, MORT, from Mount Olive, New Jersey. We understand that starting a FRC team isn't always easy, but maintaining one can become a challenge as well. After having a FRC team for some time, more than likely your number of students starts to rise. This was just the case for the Mount Olive Robotics team. While having more students is great, you don't want it to get to the point where not everyone is getting the full experience of the program. In order to ensure that each student was getting the hands-on experience they need to progress, we created a second FRC team within our high school, team 193 MORT Beta. Within this document is advice, tips and an overview of all the elements that go into creating an additional FRC team.

Beta consists of incoming freshmen and sophomores, some of whom, have no experience building robots. This means that the process of how things work is a little different than what we have done in the past. To start, there are no sub-teams on Beta. This allows students to fully engage in any part of the team that they desire, when they want. By doing so, students can explore their capabilities and find specific interests.

In the process of creating Beta, mentors were a key element, as to any team. Beta mentors are all drawn from MORT alumni, who came back to share their FIRST knowledge and their professional working experience. While having checked off mentors on the list of important factors, funding came into play as well. Because Beta is directly tied to our Varsity team, MORT 11, Team 193 was not considered a rookie team. This meant that rookie grants were not available. Fortunately, the facility we use is big enough to fit both teams so there was no need to buy separate machinery and tools. This cut costs down tremendously, but this is not always the case for teams that would like to consider an additional team. Existing sponsors, your board of education and your community are all great places to start for support. Going to your school's principal is also a good place to start for requesting additional space, such as your school's woodshop or an empty classroom.

Having another team along side the other is a great way to exchange knowledge and advice, prevents students from becoming uninterested in the program by giving each of them an equal amount of hands on time, as well as being able to attend more events. While both teams give each other advice and the varsity team will assist the junior varsity team, these are two separate FRC teams who build very different robots. It is essential for both teams to get along and have the same values, but remember these are two separate FRC teams, not extra people for your original team.

By the end of this resource, you will have discovered how a "Beta" team works, and what kind of elements go into creating one. By developing more teams, the number of FIRST participants increases, spreading its message even further!

-MORT, FRC Team 11

Additional questions, comments, or concerns? Contact us at 973-927-2208, ext. 7647 or by email at dbodmer@mort11.org. Visit our website: mort11.org

September through January

Overview: Between the months September through January the incoming freshman get to know each other for the following build season. These few weeks are entitled MORT University where children get hands on opportunity about the program as a whole. Students that may have never seen the game before are presented with challenges and thought provoking games preparing them for the build season to come.

Week 1: Week 1 is where the members are introduced to the program on how it works and functions. The mentors/alumni make sure they talk about FIRST as a program and what Beta is. Then the mentors try to engage all the students into an activity where teamwork and cooperation is involved. This year the Beta team mentors put together an activity. The challenge starts off with the students breaking up into teams of 4-5 people with paper materials such as cardboard and tape. Each group gets 7 minutes to make a plan on building the tallest tower possible with the materials given. The members of the group are allowed to talk during the 7 minutes planning period but shall remain quiet when given a few minutes to actually build the tower. In this activity students built cooperation and teamwork skills that would be needed throughout the season to succeed as a team. For the mentors this activity worked out well because they did not have to talk about all these skills because the students acquired them through this hands on activity.

Week 2: Throughout Beta, mentors guide the students on building the most efficient robot possible. In doing so a problem is introduced to the students where the mentors ask the students in groups to build a robot that, for example saves miners from a collapsed mine. This week allows students to come up with various solutions to the problem that is given. Here the groups decides what robot would be best for the task and what parts or features the robot needs. By doing this the students get ready to face the official task introduced later on in the year. Through this activity they learn to try different solutions to the problem coming up with the best one. The robots are created for each group and the last few days of the week are left to presenting what the students have

made. In the presentation the Beta members will explain what they built, what features they included and how the robot that they created is effective.

Week 3-5: In weeks 3 to 5 students are put into rotations on the three different sub-teams of Beta (mechanical, programming, and electrical). The mentors are split up into the three categories and a handful of students are first assigned to a group. Then they are allowed to rotate into the groups that they feel interested in. This allows first time students to get a hands on opportunity on what they are going to do in each category throughout the season. Even though each sub-team is not permanent, the student gets a feel for what they want to do as they get involved in the future years with the varsity team.

Week 6: This is the last week before the actual task for the year is introduced. In this week the mentors stress the importance of FIRST to the team and wrap up the final details. The mentors also engage the student's in a trivia game to make sure they have learned aspects of the Beta program through Beta University. The mentors also put together a parent meeting to make the parents aware of the programs their kids are getting into. In this meeting what the kids have been doing throughout the 6 weeks is described. FIRST and Beta as a whole is explained further in detail so the parents know what is going to happen in the weeks to come.

Overall, Beta University was put into place so students have an opportunity to get involved in the program. Through this they are able to experiment their interests on what they are going to contribute to the team in the years to come. Beta University is a great way to let the new members choose what sub-team they would like to stick through for MORT. Although they are allowed to change Beta University gets them mentally prepared to the sub-team they are going to be most dedicated to.

Build Season Overview

January: On the first Saturday of this month, FIRST sends out its new game challenge for the season. Normally the team would begin to brainstorm and hypothesize as soon as the narrator of the clip ends with “Good luck! And we’ll see you at the competitions”. But what the Beta mentors do is break down the game piece by piece and emphasize the rules and regulations before an idea is created. It is important that mentors don't waste any time because the pace differs with first year students from that of an experienced team.

Week one: The mentors have a mentor’s meeting at the start of the week. They sit down and utilize their knowledge of FIRST, the new challenge, the rules, as well as their professional experience and step back into their high school robotics shoes. They act as a small, unofficial FIRST team and deconstruct the game to figure out core concepts.

- The mentors and students gather and the mentors present the core concepts. They break it down in a way that helps the students concentrate on key ideas and then start developing ideas
- Next is strategy. Once the team decides on a few options for strategy, they vote on what they think will be best.
- After choosing a strategy the mentors explain that two ideas needed to be put in place. There would be a primary and a secondary. The focus would be put on the primary, and anything extra would go towards the secondary.

Week 2: This is the week that is more hands on, in terms of the robot. Students begin the long process of what really goes into making a robot they think will achieve their goal in the best way possible.

- Taking what they learned over the course of the school year, previous knowledge, their talent, and what the team decided on in week one of build season, the students will draw their robot. There will be a lot of rough drafts, different visions and a large cloud of creativity.
- Once finished with the drawings, the team then takes another vote on either one specific drawing or take bits and pieces from each one to create a whole different one.
- Students brainstorm mechanisms to accomplish their strategy.
- Mentors do not expect their students to know what the mechanisms are, but by encouraging the use of real world connections, it makes it a lot easier for them to

express what they'd like the robot to do. For example, if the students wanted the robot to shoot the balls, they could compare it to a tennis ball shooter.

- By the end of this week, prototypes of mechanisms were finished.

Quick Tip: It's very important that you keep track of time during this process. Drawing something on paper takes less time than figuring out how you can build it.

Week 3: Now that things are getting underway, it's time to get the students excited about competitions and inform them of all the responsibilities that are available. Getting a head start on preparations for competitions is beneficial and will be added to in the next couple of weeks.

Beta mentors came up with a specific set of standards in order to ensure they'd get the best possible people for the job.

- For more information on the drive team positions, please refer to page x.
- Spirit team members will brainstorm ideas about themes and how they would like to utilize their materials. Whether it be signs, a decorated pit, or team shirts, spirit team comes together to figure out what they want to do.
- Scouting members meet to analyze the game in order to identify important parts of it and develop a way to be able to analyze the data at a competition.
- During this week, the team decides on which prototype design will be used on the final robot, the drive is train no longer is in prototype condition; real parts are being fabricated and used.

Week 4: Not only is the robot coming together, so is the team.

Robot:

- The foundation of the robot should be close to finished.
- The end effector has been selected.
- The robot design is being finalized.
 - The students interested in the electrical components of the robot will decide on where the electronics will go on the robot.
 - Students are building with raw materials

Competition Preparations:

- During MORT University, students were able to explore their talents and capabilities.
- Most students have found what they like to do and want to be a part of and now this is a time where they get to show off what they have learned, even though the learning never stops.

- Make sure, as a mentor, to step back every now and then to watch and appreciate all of the hard work and effort each of the students put in.
- Mentors continue to engage students to ensure maximum involvement from each team member.
- Communication throughout each part of the team is reinforced.
- Scouting sheets are beginning to be developed.
- Spirit team is creating signs and desired items for the stands such as noise makers, pom poms and any pieces necessary to cheer for their drive team.
- Drive team members and reserves are selected and announced and their parents are contacted and informed of the requirements for the position.

Week 5: As you get closer to the deadline of when the robot should be finished, staying organized is the best possible way to keep the process running smoothly and stress levels down.

- Even though you should ALWAYS keep your working space clean, it is very helpful to work in an organized area while building the robot.
- Restock any drawers, cabinets and closets with necessary materials, so if any new ideas need to be implemented in the design of your robot, the materials will be on hand.
- The robot should be in decent shape by now, in most cases running and practicing.
- It is essential to leave some time to test the robot before the first competition so you can fix any last minute complications, or even go back and add a few minor details.

Week 6: This is the last week to build your robot.

- This is the time to complete any last minute preparations for the upcoming competition season.
- Have the crate that your robot will be shipped in ready.
- Make a list of all the important things that NEED to be completed by the end of the week. (This includes your robot!)
- Update your schedule because you will most likely need to come in more days a week than you have been, depending on how much time you need.

Overall: There is a lot of work that goes not only into the robot itself, but also a successful build season.

- Don't forget to thank:
 - Students for all of their hard work

- Mentors for all of their time and effort
 - Custodians/owners of where you are working for their dedication to making your build season possible
 - Parents for staying by your side and supporting you
 - Potential sponsors
 - Anyone else who you think deserves credit for making the season happen
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- Be active during build season! Don't let someone tell you that you can't do something. It is a place of exploration, a time to develop an inspirational atmosphere and encourage students to share their opinions.
 - There are no dumb questions!
 - Have confidence in yourself, robot and your team!

Thank you for taking a look at our Beta Binder! We hope you found this informational and helpful. We are looking forward to seeing even more new faces in the seasons to come!

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