2025

TEAM 2035 HANDBOOK

This handbook describes the 2035 FRC team structure, how FRC competitions work, and team policies and procedures. Use it to get familiar with the team before signing up, to refresh your memory on team details after signing up, and to share team information with fellow students and your family.

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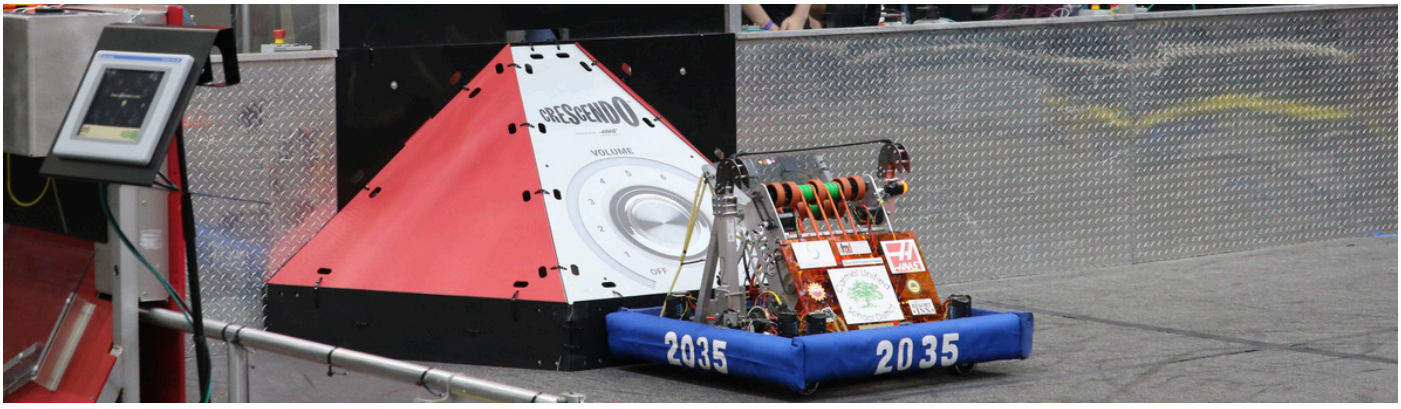
WHAT IS TEAM 2035 - ROCKIN' BOTS?

Team 2035 is the Carmel High School FIRST Robotics Competition (FRC) team and club. The club's purpose is to participate in two FRC competitions in the winter and spring of each school year. FIRST (For Inspiration and Recognition of Science and Technology) is a world-wide organization that prepares young people for the future through robotics (www.firstinspires.org). They create a new robot game each year and reveal it on YouTube in early January. All FRC teams then spring into action during the January-March build season, where a robot is designed, constructed, and tested. The robot should be able to play the revealed game!

Historically, FRC teams are assigned a team number that is incremented by one for each new team that is formed. team number (say, 254 The Cheesy Poofs) indicates an older team, whereas a larger number (say, 10339, the Chartwell team) indicates a newer team. The Rockin' Bots were formed in 2007, and so have the relatively low number of 2035.

For many years, Team 2035 called themselves the Robo Rockin' Bots, but this was shortened to the Rockin' Bots in 2024.

Team 2035 was the first FRC team in the Monterey Bay Area. As the team progressed through each FRC build season and participated in competitions, it also performed many acts of outreach and team seeding. 2035, under the Mentorship of Mr. Paul McFarlin and Mr. Tom Clifford, helped start the currently successful FRC teams at Pacific Grove High, Monterey High, Hollister High, and others.



GUIDING **PRINCIPLES**

Gracious Professionalism

Since 2035 is an FRC team, and not just a casual robotics club, all participating individuals (Mentors and students) must adhere to FIRST's rules of conduct, which they sum up as Gracious Professionalism (GP). The definition of GP given by FIRST is:

"It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. Through Gracious Professionalism, fierce competition and mutual gain coexist."

So while we compete against our friends and neighboring schools at the FRC competitions, we also come to their aid when they need it, and we ask for help when we need it. We are both competitors and colleagues.

Mutual Respect and Kindness

Gracious Professionalism is built on respect (also be sure to read the section on Behavior Expectations) for each other, for the Mentors, for the parents, for the lab, for the tools, and for FIRST. But we need to go further and emphasize kindness as well. This means going the extra mile to help someone in need and to balance our engineering criticisms with kind words of encouragement and praise.

Striving for Excellence

Embracing Gracious Professionalism, respect, and kindness creates an atmosphere where each team member can strive for their own version of greatness. That might be excellence at the use of power tools, CAD software, fund-raising, project management, robot driving, or any number of other aspects of an FRC team.

Overall Engineering Goal

We strive for greatness, but we don't require a specific outcome or ranking. The overall engineering goal is the following:

"Design, build, and test a competitive robot by the start of the first enrolled FRC competition event."

Every word of that engineering goal is important. "Competitive" means that our ranking at the end of a competition is above average. If there are 36 teams at the competition, we will have been competitive if we land in the top 18 in terms of the FRC-style ranking system.

This goal is deceptively difficult because of the constraints on time (two months) and resources, which include shop time, field time, number of students, number of Mentors, and funding for travel and supplies. These constraints are similar to what engineers deal with in their day-to-day engineering jobs–you have to do the best you can given the requirements (FRC's game), your abilities (the team), and your resources (funding and equipment).

FIRST ROBOTICS COMPETITION

BASICS

An FRC competition is a collection of matches, each lasting about two minutes, that pit three red robots against three blue robots. The red robots are the Red Alliance and the blue robots are the Blue Alliance. The Alliances are chosen randomly by FIRST for each match, and the individual teams signify their alliance color by installation of removable colored bumpers around the perimeter of the robot chassis.

The robots must play the particular FRC game that was created by FIRST and revealed in early January. The Red Alliance robots cooperate, the Blue Alliance robots cooperate, and the Alliances each try to stymie the other Alliance by playing various forms of defense. The 2024 game was called Crescendo, the 2023 game was Charged Up, and the 2022 game was Rapid React. The 2025 game will be called ReefScape, and the details of the game will be revealed in early January 2025. This is done through a YouTube video and the simultaneous release of a detailed game manual.

At the end of a competition, the results from all the played matches are used to rank all participating teams. The highest-ranking team wins the competition and earns a berth at the FRC world championships in April.

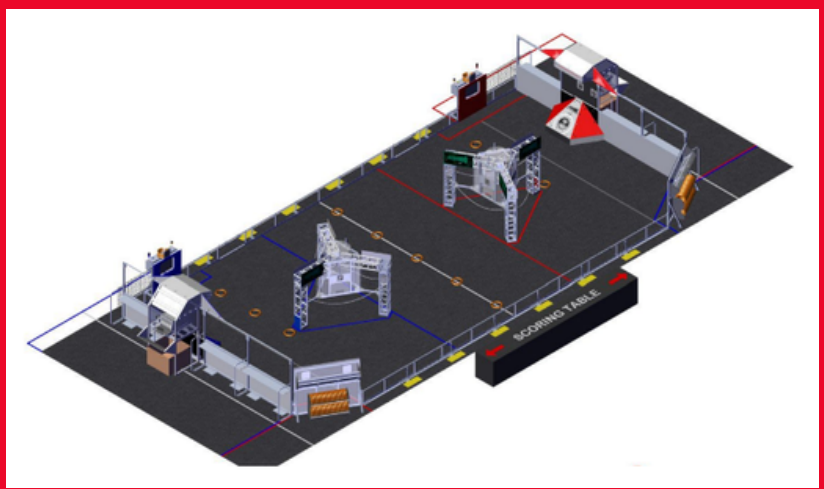
GRACIOUS PROFESSIONALISM

FIRST requires all participants in FRC to exhibit Gracious Professionalism at all times, including build days at school, outreach events, and competitions. GP is the idea that we all strive to show respect for each other in all of our interactions and work hard to develop professionalism in our FRC work. Examples of professionalism include reliability, setting and achieving high interpersonal and technical quality standards, and being industrious, organized, and accountable for your speech and actions.

THE PLAYING FIELD

The six robots play the season's game on a playing field that is approximately 30' x 60'. A rendition of the Crescendo field is shown below. While the field dimensions are approximately constant from year to year, the game changes, and so the field elements change from year to year. Field elements are interactive mechanisms or obstacles. In Crescendo, the field elements were a Speaker, an Amplifier, and a Stage. Each of these had several subparts as well. A game piece is an item that the robots must interact with to score points. For example, in Charged Up, the robots had to pick up traffic cones in one area of the field and place them on poles in another area of the field.

The Rockin' Bots do not have a practice field at Carmel High (yet!), which makes full testing of the robot and its subsystems difficult. However, a few Monterey Bay Area teams do have fields and do host open field days during the build season. Significant test and refinement can be done, nevertheless, by constructing wooden versions of the field elements and performing simple tests of the associated robot subsystems.



FRC COMPETITIONS

FRC competitions start about eight weeks after the January reveal day and continue for the following six weeks. The competitions are large events with typically 36 or more FRC teams competing.

A competition consists of a set-up day, a practice day (not always provided), and then two competition days. The final part of the last day is the playoffs, where the best teams compete to determine who wins the competition.

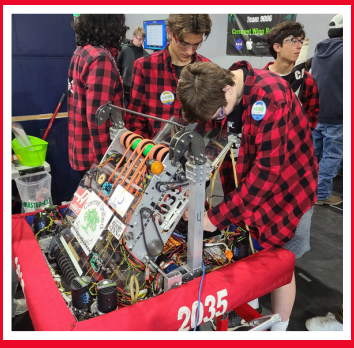
At a competition, each team is allotted a 10’x10’ (approximately) space in a room adjacent to the playing field called the pit. Each team brings what it thinks it needs to maintain their robot throughout the competition, and that can fit in the allotted space. Many teams take pride in a good-looking and highly functional pit, but the main objective is to bring the tools you’ll need. Here are some examples:

After the practice day, the competition starts. It is composed of a large number of two-minute (approximately) matches, each involving six teams’ robots. The teams are selected randomly for each match and are divided into two Alliances: Red and Blue. Each team must have a set of red bumpers and a set of blue bumpers for their robot, which can be quickly swapped as the color of the Alliance for each team varies over the matches. (Team 2605 has their blue bumpers on in the pit picture above).

Throughout the competition, the robots and their human drivers play the game and score points as best they can. In every year’s game, there are tasks that provide ranking points. These are the points that are used to rank (score) the teams during the competition. Additionally, there is one Alliance in the playoffs that wins the playoffs. These achievements are used to determine who wins the competition and the rankings of the remaining teams. A winner gets a ticket to the World Championships.

TEAM
STRUCTURE

ROLES



Student Members

Student team members are either Leaders or Staff. Leaders have extra responsibilities relative to Staff (see below). A typical progression is that a Freshman joins the team as a Staff member, and joins one or more Groups (see below). After a couple years of contributing to Groups as a Staff member, the team member can move into a Leadership role if desired and if assigned a Leadership position by the Mentors. Alternatively, and more probably, a team member remains a Staff member for the duration of their tenure with the team because the number of Leaders is small compared to the number of needed team members overall. Going into Leadership is not at all required to make huge contributions to the team! As in the wider world of engineering, many engineers may not make good leaders, but certainly some do!

Student Leaders

The student leaders are the heads of the various Groups, or Departments, that make up the full team. Student leaders have the responsibility of ensuring that their Group is functioning well, with all Group members being assigned suitable tasks and responsibilities. The Group Leader must devote significant time to managing the group, which will take away from time spent on direct design, building, and testing of the team's robots. Management includes supervision of tasks, conflict resolution, meeting with other Group Leaders, meeting with Mentors, creation and maintenance of schedules, and various forms of troubleshooting. There roles will be selected by the Mentors.

Do not consider yourself for a Group Leader role if you want to devote all your time to technical work; leaders need to lead. This is normal in engineering. There are engineering leaders and there are individual engineering contributors. We need both!

Captain

The student head of the entire team. Typically the Captain is a Junior or Senior with significant prior experience as a Group Leader or individual contributor. The Captain is like a Project Manager in the adult engineering world–responsible for all aspects of the project. A crucial task for the Captain is to meet frequently with all the Group Leaders to receive status reports, brainstorm designs, help with troubleshooting, and lead in decision-making.

TEAM STRUCTURE

ROLES (CONTINUED)

Mentors

Adults with experience in some aspect of engineering, business, or project management. The Mentors guide the students, rather than engage in significant robot design or construction. Mentors attempt to construct, instead, the team structure that will lead to FRC success. Concrete examples include selection of Group Leaders, types of face-to-face meetings, selection of electronic communication methods (e.g., Slack), amount of shop time, outreach events, etc.

Mentors with significant relevant engineering experience can also train students to use hand tools and power tools, CAD software, and the employment of mathematical models to achieve design goals and high-precision robot motion (e.g., vision systems).

Mentors with significant business experience can assist students in fundraising, obtaining sponsorships, obtaining grants, internal marketing (to CHS), external marketing (to local middle schools), team morale boosters (T-shirts, buttons, etc.).

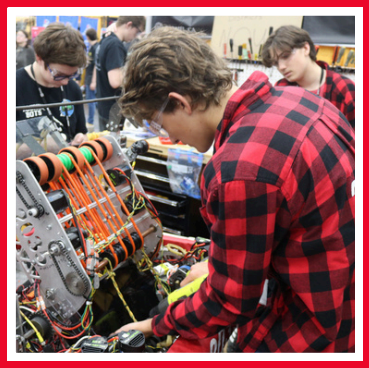
Mentors with significant project management can assist students in construction of project milestones and schedules, and help to identify likely conflicts between the goals and plans of the different Groups. This is crucial to the success of the team.

Lead Mentor (Coach)

The Coach is responsible for the overall team philosophy, structure, and for its success. The Coach is the first point of contact between FIRST and the team, and works closely with the other Mentors and Group Leaders. The technical role of the Coach is similar to that of the (student) Captain, in that they must focus on the big system picture as well as removing obstacles to success for all team members. Major team decisions are typically made by the coach, with varying levels of input from the other Mentors, Group Leaders, FIRST, and CHS Administration.

TEAM STRUCTURE

ROLES (CONTINUED)



Lead Advisor

The Lead Advisor makes significant contributions to the team philosophy and structure. The Advisor has a critical role in being the first point of contact between the school and the school's Administration.

Tool Wrangler

A student role in which the Wrangler keeps track of all tools and their conditions during a build day or competition day. Tool Wranglers can instruct team members in the proper use and storage of tools when necessary. This limits the situation in which tools are scattered around the floor or a workbench, even when not in use, which prevents other members from efficiently finding and using those tools. Overall, the Wrangler will look to develop a high level of **tool respect** in all team members. The Wrangler will also be the default Cleanup Captain. During cleanup at the end of a build day, the Cleanup Captain will not perform cleaning themselves, but will be responsible for organizing other team members' cleanup activities– they ensure the job gets done correctly.

Shop Manager

The Shop Manager works closely with the Coach to maintain an up-to-date inventory of tools and consumable resources such as bolts, zip ties, adhesives, electrical tape, various-gauge wires, wago connectors, batteries, battery cables, sheet metal, wood, etc. This enables the Mentors to ensure that the shop is always well-stocked and that no design, construction, or test delays happen due to dealing with order lead times or missing resources.

TEAM STRUCTURE

GROUPS

Build

The Build Group is responsible for construction of the robot and its subsystems as well as construction of helper items such as field elements (usually out of wood). Build group members are interested in gaining proficiency at using a variety of hand and power tools; developing and using knowledge of various materials such as aluminum, steep, wood, and plastics; and doing teamwork-oriented construction and demolition.

Design

The Design Group is responsible for conceptual design of the competition robot and all of its subsystems (such as an intake mechanism, a shooting mechanism, the drive subsystem, etc.). Conceptual design eventually leads to detailed design with computer-aided design tools such as Fusion and Onshape. Design team members will use tools such as pencil-and-paper, whiteboard, face-to-face meetings, and subsystem prototypes to develop a design concept to the point that it merits detailed design and drawing with CAD tools. Depending on the number of team members available and interested in Design and CAD, the Design and CAD Groups may be merged into a single group.

Computer-Aided Design (CAD)

The CAD Group is responsible for creating **and maintaining** detailed computer-aided design drawings of the competition robot and all of its subsystems. The default software package is Fusion. The CAD Group members take the conceptual design produced from the Design Group activities and create to-scale drawings, filling in details such as bolt holes, bands, electrical-component placement, lights, etc. The Build and Mechanical Groups then use these drawings as the basis for their construction efforts. It is critical for the CAD team to update the drawings as the Build and Mechanical Groups progress through various re-design iterations of the design cycle.

TEAM STRUCTURE

GROUPS (CONTINUED)

Drive/Game Strategy

The Drive/Strategy Group is composed of the Drive Team and members interested in developing advanced game-play strategies for the FRC game that must be played at competitions. Developing strategy for an FRC game is not as easy as it seems, and sometimes even the best FRC teams develop a winning strategy only after engaging in their first competition event. The Drive Team is composed of Driver 1, Driver 2, Drive Coach, and the Human Player (game-dependent). The Drive Coach may be a Mentor, but the goal of the 2035 Lead Mentor and Lead Advisor is to have an all-student drive team if possible. Driver 1 is the default driver of the robot, Driver 2 operates some or all of the subsystems (for example, initiating a climb or hook-and-hang maneuver). The method of selecting Driver 1, Driver 2, and the Drive Coach will vary year-to-year. Typically Driver 1 is the Drive/Strategy Lead, but this is not required. Nominate yourself for the Drive/Strategy Lead if you want to spend significant time developing your robot driving skills and thinking about how to contribute to a winning alliance given the particular strengths and weaknesses of the 2035 robot.

Programming/Electrical

The Programming/Electrical Group is responsible for all electrical aspects of the robot as well as all software that controls the robot (this excludes CAD software for example). Electrical elements include the battery, the controller (roboRio), the power-distribution board, the WiFi radio, all power- and data-distribution wires and cables, circuit breakers, beam-break devices, cameras, etc. The Programming/Electrical Group will work closely with the CAD and Mechanical Groups to ensure that all required electrical components are accounted for in all final CAD drawings. Nominate yourself for Programming/Electrical Lead if you have experience with Java programming, electrical circuits, and digital control of mechanical devices (such as drones, remote-controlled vehicles, etc.).

TEAM STRUCTURE

GROUPS (CONTINUED)

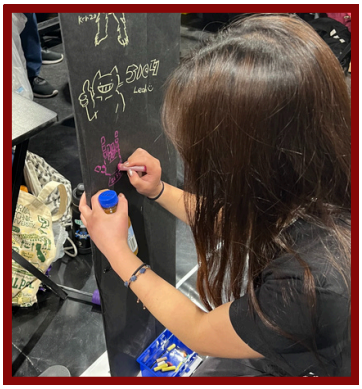
Mechanical

The Mechanical Group is responsible for the creation of custom-built aspects of the robot design, such as the frame members, subsystem elements, pulley systems, etc. To do this, Mechanical Group members will use hand and power tools to cut metal pieces, drill bolt holes, remove burrs, etc. They will also make substantial use of 3D printers to print parts such as wheels, pulleys, bands, etc., thereby avoiding the more time-consuming metal-based options. The Mechanical Group is primarily responsible for system integration, which means the connecting of all required subsystems into a unified whole as defined by the robot CAD drawings. Nominate yourself for Mechanical Lead if you have experience with metal-cutting tools, 3D printers, and working from CAD drawings.

Marketing/Outreach

The Marketing Group is responsible for a large number of crucial activities and resources. The Group obtains external funding, such as grants and donations; advertises the team internally to the rest of CHS; advertises and executes outreach events for local schools; maintains the team public-facing website (https://2035.rocks); and manages internal IT resources such as shared drives and team archives. In addition, the Marketing Group is responsible for the maintenance and updating of other public-facing social-media representations of the team, such as those that might be found on the Blue Alliance and Chief Delphi websites.

Scouting is also the responsibility of the Marketing Group. In FRC, Scouting is the gathering of competition-relevant information on all teams, especially during a competition, and the analysis thereof relating to alliance team-picking during a competition's playoff. That is, which teams at a competition should we pick to be on our alliance, should we be in such a position?



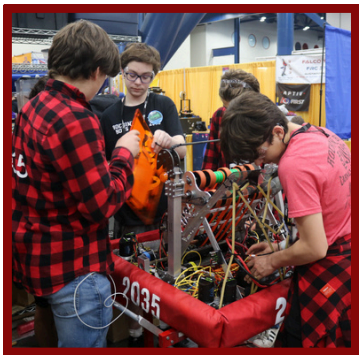
Marketing is a business-oriented Group as opposed to most of the other Groups, which are engineering-oriented. All successful FRC teams have substantial Marketing Groups. Nominate yourself as Leader of the Marketing Group if you are most interested in developing and extending the business and financial aspects of the team.

TEAM STRUCTURE

GROUPS (CONTINUED)

Quality

The Quality Group is assigned the sole responsibility of surveying the activities of all other Groups with an eye toward detecting current and future problems or robot flaws. The Quality Group members act as system engineers, who are engineers responsible for the total system design, implementation, and testing, rather than one aspect of it as other Groups are. The Quality Group can see the “big picture” and may be able to detect those cases where subsystem implementation by one Group (e.g., Mechanical) is misaligned with the design/implementation of another Group (e.g., Programming/Electrical). The Quality Group will work closely with the Captain and Mentors. Should the team be too small in number, the Quality Group responsibilities will fall more heavily on the Captain. Nominate yourself for Quality Lead if you want to see that big picture come together successfully in the short time we have to design, build, and test the competition-ready robot.



Safety

The Safety Group is responsible for ensuring that the team is aware of all established safety protocols and rules, and for identifying areas in which rules must be modified or new rules established. For example, the safety procedures for a mill (metal cutter) or bandsaw may have to be revised if the tool is moved to a different location or if new optional add-ons are purchased for the tool. If an entirely new tool is purchased, the Safety Group will have to develop appropriate 2035 safety procedures for that tool. Safety Group members can also survey the activities of build days and competition days and ensure that team members are using protective eyewear, shoes, clothes, etc. at all appropriate times. Safety Group members can also inspect the safety equipment, such as protective eyewear, ear plugs, earmuffs, gloves, etc. and recommend new purchases to the Mentors and Marketing Group. Nominate yourself for Safety Lead if you have a strong interest in maintaining and developing a safe environment, through technology and through behavioral rules, for all of the 2035 team members.

THE FRC YEARLY CYCLE

Reveal Day

EARLY JANUARY

FIRST Robotics Competition Kickoff
2035 Game Analysis and Initial Brainstorming

Build Season

JANUARY-APRIL

Introductory Phase
Group Workshops
Wooden Field Elements
Prototyping
Mechanical Robot Construction
Programming for Control
Testing
Test/Refine Iteration
Competitions

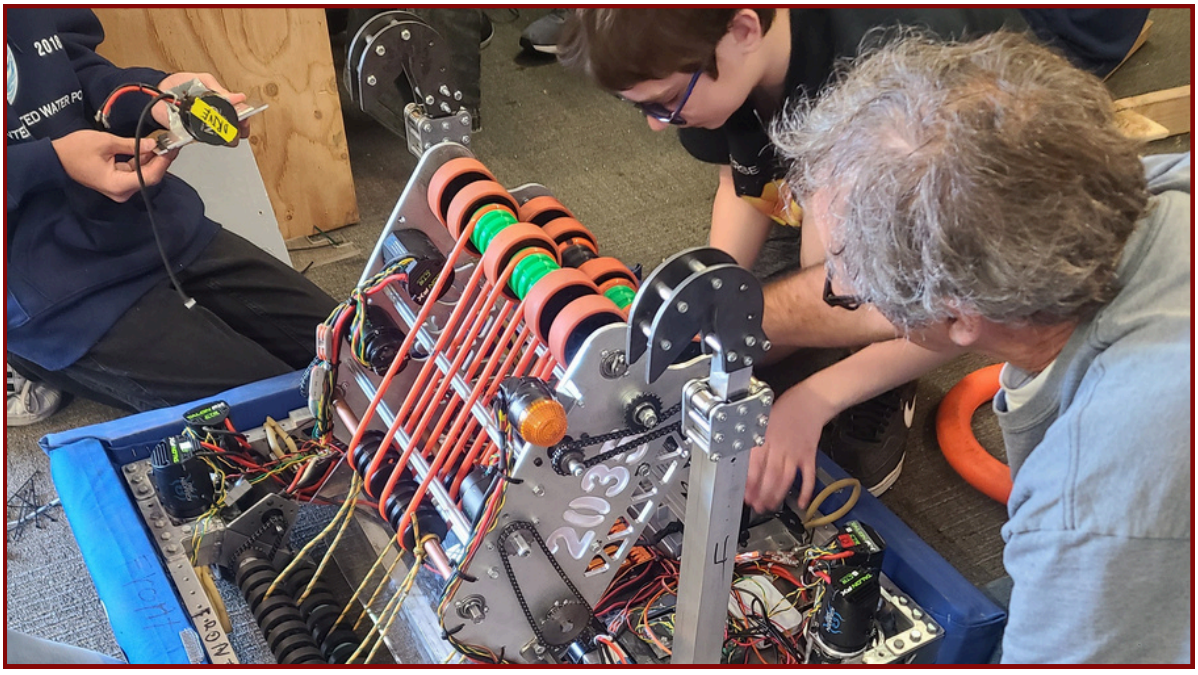
Offseason

APRIL-DECEMBER

Recruitment of new members
Training of new members
Approving members to use machines
Outreach to local elementary and middle schools
Offseason competitions (such as Madtown Throwdown)

In-School Club Meetings

Mondays at lunchtime in Room 6



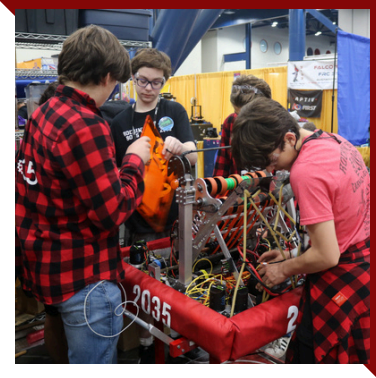
BUILD DAYS

All-Hands Meeting

At the start of a build day, all members of the team will have a meeting to discuss the plan for the day. During lunch on Mondays, we will regroup and check in on the status and schedule of the team for the week.

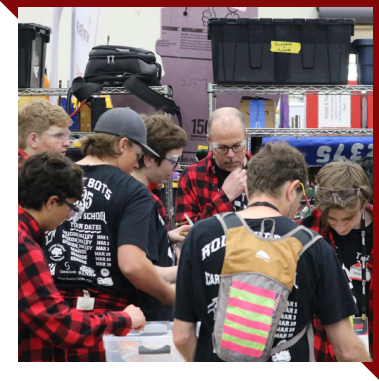
Group Meetings

The leads of the groups meet with their members to discuss the status of their given projects and decide what needs to be done that day.



Safety

All members are required to attend a safety meeting that is held at the beginning of each season, as well as take a safety quiz to check for understanding. Practicing safety procedures throughout the duration of the season is mandatory.



Leader Meetings

Typically a meeting once a week as a progress check, as it allows the team to stay updated and on track with the season schedule.

Clean Up

Each member must contribute to cleaning up. Despite who makes the mess, each member holds the responsibility to clean any mess they come across, to put any and all tools and materials away throughout the day, in order to ensure less clean up later. One final check will be performed at the end of each build day.

BUILD-DAY MEETINGS

All-Hands

This kind of meeting means “everyone must attend,” and comes from an old Navy command called “All hands on deck.” An all-hands meeting is used to make announcements, allow for group decisions, and make coarse plans. All-hands meetings keep all team members on the “same sheet of music” or the “same page.” Everyone understands what the basic plan is, what the important issues are, and the composition of the team (team members may be sick or otherwise unavailable).

Scrums

This type of meeting is used in the software-development industry and is a short meeting, but frequently held. For example, each time the programming group meets, they might start with a scrum. Each team member provides a status update on what they have accomplished since the previous scrum, what they hope to accomplish in the immediate future, and if they are blocked from making progress for any reason.

Council

This meeting consists of the Mentors and the student Leaders, and are used to make key decisions, review progress, adjust schedules, and discuss how the team is doing on teamwork and technical work.

Mentor

This meeting involves only the Mentors, and is used to make key decisions, discuss behavior issues, discuss finances, etc.

Leads

The Leads meeting involves only student Group Leaders. It is used for whatever those leaders decide they need to discuss.

Groups

A Group meeting involves all the active members of a particular Group, such as Mechanical or Programming, including the student Leader. This is an important meeting for ensuring that the Group can make progress on their tasks consistent with the master schedule.

MEETINGS AT COMPETITIONS

Scrums

At competitions, most of the team members that work in the pit are the Leaders and the Mentors– the pit is too small to hold all team members that desire to be there. As such, a scrum takes the place of an All-Hands meeting in the pit.

Leads

The student Leaders will need to meet as often as needed at a competition to solve problems relating to robot repair and maintenance. Communication is vital amongst the Leaders so that proper tasking of all members in attendance can be performed. For example, team members might be dispatched to seek help, tools, materials, guidance, etc., from other teams present at the competition.

Council

Meetings involving only the Mentors and Leaders will be used to develop plans of action relating to robot repair and maintenance, and to refine game strategy. Should the team find itself in the pleasant position of being an Alliance Captain in the playoffs, Council meetings could be used to review scouting information so that a team-picking strategy can be created.

COMMUNICATION CHANNELS

Slack

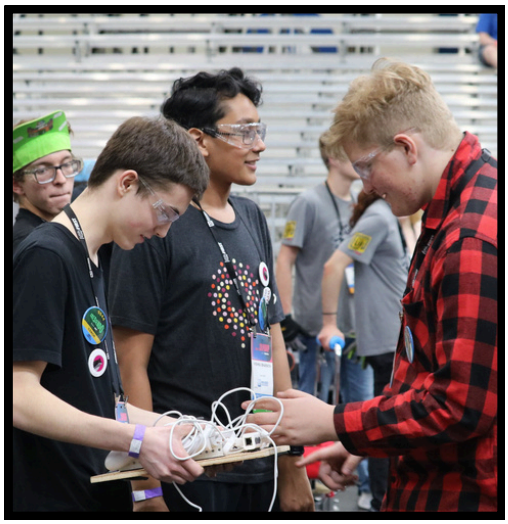
A platform utilized by student and adult leaders to communicate more personally with one another. It consists of different channels that pertain to different groups that lie within the team.

Remind

A platform used to maintain consistent and up-to-date communication with the team's student members, parents, and mentors throughout the season, as well as any additional events during the off season. Used largely for announcements.

BEHAVIOR EXPECTATIONS

The following provides an example of a behavior-expectation framework. It is expected to be sufficient to handle all cases of poor behavior and conflicts between team members, mentors, parents, teachers, and administrators. However, the 2035 mentors will have the flexibility to adjust the overall approach to expectations and consequences as time goes by.



The overall goal of the Rockin' Bots FRC team is to learn and practice engineering teamwork. This goal requires that each team member behave in such a way as to maximize the ability of all team members to learn and contribute to the engineering, business, and game-play aspects of an FRC team. Behavior expectations rest on the following pillars:

FRC's Gracious Professionalism
According to FIRST, GP is "a way of doing things that encourages high quality work, emphasizes the value of others, and respects individuals and the community."

Safety
Keep safe by taking the time to learn how to use tools properly, don't use a tool or engage in a build practice that you don't understand, and watch out for unsafe or risky behavior in others as they perform their work or work with you. Be familiar with, and follow, the team- and school-approved safety protocols. Examples of these protocols are when to wear safety glasses, how to repair and store robot batteries, and how to care for hand tools and power tools.

Respect
What does respect mean? Showing respect for a person, an idea, or an object means behaving toward that person, idea, or object in a way that recognizes and maintains the value of that thing. We show respect for people's time by not being late to meetings with them. We show respect for a tool by not leaving it out in the rain. We show respect for an idea by taking it seriously before deciding to reject or accept it. Respectful behavior is mandatory for all Rockin' Bot team members.

Kindness
You can think of kindness as the opposite of being mean. It goes beyond respect, where you act to preserve and uphold the inherent value of a person, in that it attempts to help, console, encourage, or congratulate a person appropriately.

DISCIPLINE PROTOCOLS

If a team member exhibits disrespect–toward another member, a mentor, or anyone else–action will be taken by a Mentor to minimize the chance of further disrespect. First-time offenses will earn correspondingly mild consequences. Repeat disrespectful offenses will earn escalated (increased) consequences. There will be similar escalating consequences for incidents of unsafe behavior. The escalation process is outlined here:

Problematic Behavior Type	Severity	Some Examples	Number	Discipline & Consequence
Unsafe	Mild	Forgot to wear safety glasses, open-toe shoes	1	Reminder, one-on-one discussion with Mentor
			> 1	Discussion with Mentors, Temporary suspension from Group or from Team
	Serious	Playing with electrical equipment or tools, using a power tool without proper training, pushing/shoving near power tools	1	Discussion with Mentor
			> 1	Temporary or permanent suspension from Team
Disrespectful	Mild	Insults, yelling, telling someone to shut up, browbeating	1	Discussion with Mentor
			>1	Referral to CHS Administration;Temporary or permanent suspension from Team
	Serious	Berating, starting rumors, profane insults	1	Temporary or permanent suspension from Team
			>1	Permanent removal from Team
Bullying and Harassment	Serious	Physical bullying: hitting, kicking, tripping, etc. Destruction of property. Sabotage. Cyberbullying: disrespect, name-calling, rumors, false accusations on social media	Any	Temporary or permanent suspension from Team

All 2035 team members are required to understand these behavioral expectations and disciplinary consequences. Each team member must sign and date the behavior contract that appears at the end of this Handbook before the January build season, acknowledging their understanding and intention to comply with the expectations. Each team member must also obtain one parent's or guardian's signature indicating understanding of expectations and consequences.

BEHAVIORAL EXPECTATIONS

MENTORS

Mentors of 2035 are expected to assist students in reaching the places they wish to go. Mentors should be prepared to give advice to students and provide assistance if needed, but should avoid taking direct involvement in the main assets of the team. This will ensure that our team can be driven by the students, but students still have someone to provide needed guidance and structure. Mentors also are expected to model a standard of behavior that students can look up to and must treat all students equally and with respect.

When mentors are at FIRST events, 2035 will also expect them to follow all the rules that FIRST has in place for those events.

In the event that a mentor may need to resolve a conflict, mentors should try their hardest to look at the situation in an unbiased way and present a resolution that they believe ethically resolves the situation. While mentors should not be closed-minded to changing their choice if it was not informed enough or contained bias, mentors can also confirm their verdict if they still believe it is ethically correct. If the mentor is asked to resolve a conflict and they know they have significant bias that may affect their choice, they should pass the conflict resolution task to another mentor or to CHS Administration personnel.

If any mentor violates these behavior rules, depending on the severity, they may be subject to various repercussions, ranging from conversations with the lead mentor or CHS Administration to suspension from their mentor role.

PARENTS

As a 2035 parent, we hope that your student has a positive experience with our team. To strive for this, we expect all parents to treat all students, mentors, and other parents with respect and kindness. Parents should also set examples of behavior for students, discouraging negative behavior within 2035.

If you have any questions, concerns, or conflicts, we expect parents to contact adult mentors in a private and respectful manner either online, or in person. Online contact will usually be preferred as first contact and adult mentors are accessible through Remind and other forms of connection, such as CHS email, that they have publicly shared with the team. If a parent and a mentor are in disagreement with each other for any reason, conversations should stay professional and respectful. While parents can disagree with the positions adult mentors take and ask for a change in actions or re-evaluation, this does not mean that a mentor is required to do so. Conflicts between parents and mentors that cannot be resolved in a reasonable time will be referred to CHS Administration.

Parents are also allowed to come to FIRST events as they are open to the public. But while at a FIRST event, parents are expected to follow the rules of FIRST and FRC while present at the events as well as the rules listed in this handbook. If the actions listed are not followed by parents of 2035, the mentors or CHS Administration may take corrective or preventative action as appropriate, depending on the parent’s actions and their severity.

CONFLICT RESOLUTION

If any conflict arises between two people or groups, we expect that both parties will make an attempt to resolve the conflict in a respectful manner. In the event that conflict occurs within 2035, we also expect that all on the team will continue to show gracious professionalism and respect the wishes of everyone within 2035.

When two parties resolve conflicts, they should not use the mentality of “taking sides.” Rather, both parties should go into resolving conflicts with the idea that they are working towards a common solution, like how we approach many of our goals as 2035. Just like with our build season, many conflicts will result in both parties not getting everything they want. But, people or groups that enter conflicts should be prepared for that outcome if two conflicting ideas persist.

In the event that conflict is major or cannot be resolved, team leaders or mentors may need to step in. In that case, they will likely have to make an unbiased but final decision on what needs to be done to resolve the conflict. If this is the case, members of the conflict should respect the choice that the mentor has made. In the case that they believe the mentor made an incorrect judgement, they can have a respectful talk with them to share their perspective.

If any of these rules on conflict resolution are not followed by those in conflict, depending on the severity, consequences may occur. This can include a discussion with a mentor, temporary team suspension, or even permanent team expulsion in more severe cases.

COMPETITIONS

Typical Workflow

When we arrive at our place of competition depending on how far away it is we may have a selected group of people set up our pit. If not, everybody is expected to pitch in. From there we will have the pit crew, the drive team, and the scouters. Pit crew commonly overlaps with drive team and will do a large amount of the work on the robot in the event of a failure or breaking of a piece/system. Drive team is the selected group by mentors to go into the drive station during a match. This will include the technician who is in charge of last minute adjustments and batteries, driver and driving coach, as well as one other drive team member with no specified job. Each person that attends the match on the field must wear a FIRST-supplied pin that shows their role.

One other pin also exists called the safety pin. The person wearing the safety pin is not allowed to leave the pit to ensure the space is secure. Our team uses this pin as a scrum position. Scouters consist of the people with no given job. They are assigned a bot at the start of each match and told to keep statistics on them such as points scored, failures, or speed. As there are only so many bots in at one time the scouting job gets split between groups. Group A will do 4 matches then group B will do the same. Each group will consist of the number of bots on the field. As many groups will be made as needed. The scrum position in the pit will be taken from these scouting teams. They will switch on a time basis to help in the pit and then return to the scouting team. Each member may be able to scrum multiple times based on the number of people that show up to competition. This system will hold consistent up until elimination rounds. If we are chosen for the playoffs, then we may assign the most qualified non-pit crew member to assist with preparing the robot and doing final checks.

Scouting

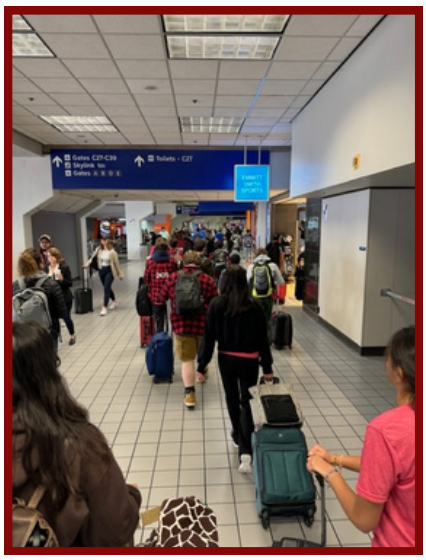
Members not in the Drive Team or Pit Crew will have designated scouting times and jobs. Scouting jobs include: watching qualification rounds, observing/studying one designated robot, filling out google forms to record that robot's functionality, etc. Scouting also includes social aspects such as the following: networking with other teams, asking them specific questions regarding their strategies/techniques, recording any additional information when needed.

A major purpose of scouting is to prepare the team for the possibility of becoming an Alliance Captain in the competition's playoff segment. Alliance Captains are teams that did well during the competition (in terms of ranking points) and so can form a fixed alliance with two other teams for the duration of the playoffs. The question becomes: Which teams do we want to pick to be on our playoff alliance? Scouting information helps answer that question.

COMPETITIONS (CONTINUED)

Eligibility

In order to participate in competitions, members must have demonstrated consistent commitment to the team and its efforts. In school years for which the 2035 team size is large, mentors may impose a formal requirement such as a minimum number of hours participating in build sessions. In other years, the mentors will make informal decisions on eligibility based on overall perception of commitment.

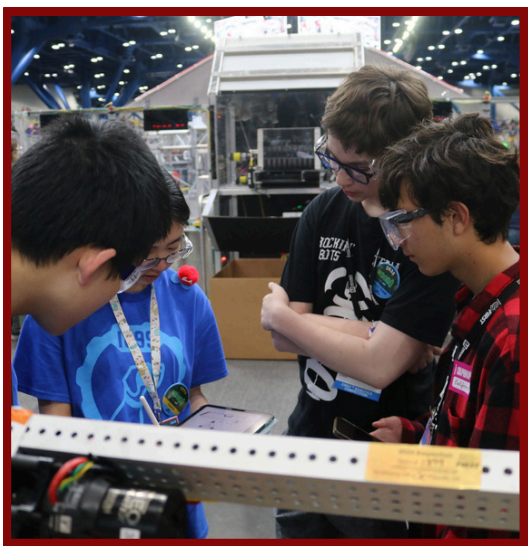


Travel

Each competition requires an element of travel. Local competitions will be either self-transport or van transportation from CHS. Competitions farther away will have all those eligible travel with the team, stay in a nearby hotel, and commute from there to the competition venue everyday.

Design Notes

During the course of the competitions students should watch matches and notice which robots function well and consistently. The students should then attempt to identify why their system works well or better than our own. If you can't understand why you can go to the teams pit and ask them questions about the bot. Most teams are very friendly and willing to tell you about the bot if they are not busy.



COMPETITIONS (CONTINUED)

Material for Judges

In most competitions teams will have a way to keep a simple and organized description of the bot. This is both for the judge to see what we use and to show to other teams. This book/pamphlet consists of requirements for the game, our goals for the game, and our plan to achieve those goals with detailed descriptions of the tools we use. This will include a parts list, drive method, and all systems. This will make the demonstration of our bot much cleaner and far easier to comprehend.

Travel

In FIRST robotics we often say the phrase “Gracious Professionalism”. When we say this we mean that we want to win fair while being kind. To this end teams will commonly help each other for missing pieces or better expertise on a subject. We have done this for teams in the past and this has been done for us. Moving forward it is expected that students will give help when asked and be kind while receiving help when necessary.

Buttons

Buttons and pins are an integral part of FRC Robotics culture and are designed and produced every year. Buttons are often traded and collected during competitions at each teams pit. During the build days, the marketing team creates multiple designs for them.

T-Shirts

New team shirts are designed and created each year by the Marketing Group. They are often based on a popular rock-music album cover in order to coordinate with the Rockin’ Bot theme. There is also a Team 2035 red flannel shirt that is the team’s staple. Members must wear shirts and/or flannels during competition.

Other Swag

Along with the shirts, the marketing group is also responsible for other swag such as keychains. New swag can always be created depending on the team’s wants and needs, and can be inspired by the particular FRC robot “game” that is played that year.

FRC REVEAL DAY

Kickoff Event

Every January the theme for that season's competition events is released. The team may attend another viewing event, or host an informal watch party, yet nothing is set in stone.

YouTube FRC Reveal Video

The FIRST Robotics Competition YouTube channel releases an animated video of that year's theme, showcasing the format and rules of the game.

Discussion

Following the release of each new game, a discussion will be held to familiarize each student member with the game's rules and regulations, along with brainstorming possible robot designs and gameplay.

Rules of the Game

The rules of the game change with each new competition; however, overarching practices such as Gracious Professionalism and Coopertition will be continuous throughout seasons.

Requirements Development

The requirements development is the process of determining what we require our robot to do for the game.

Minimum Viable Product

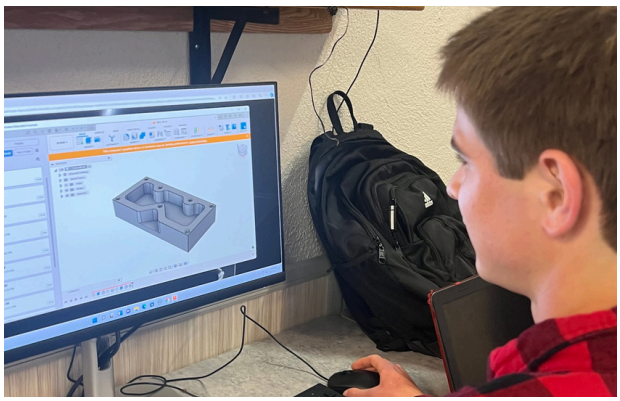
The minimum viable product is a robot that has a working drivetrain and is competitive

TYPICAL
DESIGN PROCESS

Typically the design process will start with looking at the game. What ranking points are most viable for our team and then thinking of ways to gain those points in the most efficient way possible. This will typically start with a rectangular frame with a sheet metal bottom (this is the chassis) but this may vary depending on the game. Then you move onto your swerve drive and game manipulating pieces. Eventually the design is assembled together and presented to the mentors. If the mentors approve it goes on to cad and if they do not approve or see areas for improvement we revise and present again until it is approved.

Subsystem Prototypes

The prototype is a very rough model of a subsystem, generally a manipulator of a game piece, used to find ideal geometries for manipulating that game piece. Systems such as arms, elevators, and turrets (side note, turrets nowadays are almost never needed due to swerve - your robot is a turret itself) do not need to be prototyped due to COTS (Commercial off-the-shelf) products for these existing.



Construction of Field Elements

As the Build Group's job, members work to construct each year's competition field elements out of wood. This provides a means for testing the robot in both mechanical design and programming, as well as drive practice.

Frame and Drivetrain

The Frame and Drivetrain (together called the chassis) are the most important system on the robot. It consists of three parts: the frame itself, constructed from aluminum tubing, the belly pan, generally constructed of a large aluminum plate, however it can be constructed from polycarbonate as well depending on weight. The final part of the chassis is the swerve modules, which allow the robot to move around the field, and are bought, not made, from WCP (WestCoast Products) or SDS (Swerve Drive Specialties). The bellypan and frame should generally not be pocketed/skeletonized due to those parts taking the majority of hard hits, rather have hole patterns for ease of wiring.

DESIGN PROCESS (CONTINUED)

Final Subsystem Designs

After prototyping is done and there is a general idea of what subsystems will be required on the robot, it is up to the CAD group to fully design them around the requirements of the robot and team constraints (what manufacturing processes we have, what motors we have, budget, etc). The CAD group will have to fully design down to the bolt how the subsystem will be created, including pocketing/skeletonization for weight reduction, fasteners, holes for wiring, chain/belt, etc. These designs will be reviewed by the Mechanical, CAD, and Programming groups, as well as external sources (other teams, DDS) to make sure all three major technical groups are on board.

Subsystems Implementations

The designs will then go to the Mechanical and Build groups for implementation. Most parts of subsystems will be created on one of the CNC machines such as the router, mill, plasma cutter, or 3D printer. If the team wishes to color the parts, they will be colored in red, black, or gray (Carmel High's school colors). Once the individual parts of the subsystem are created, they are passed to the Build group to assemble. Throughout the manufacturing and assembly process, the programming group will be responsible for writing code for these mechanisms, so that as soon as they are on the robot and wired they will be able to be tested.

Subsystem Integration

After individual subsystems are assembled, they must be integrated into the main robot. This will include not just build/assembly but wiring with strain relief, programming, and testing. If the main design of the robot is done well and correctly (designed around ease of programming and assembly, including wiring), this should be a fairly simple process. Once this step is done, the team should have a working robot.

Test/Assess/Refine/Redesign Iterative Loop

As we know in engineering, nothing is ever truly considered "done". This is especially true in FRC, as you can continually expand upon and optimize your robot. This will happen after the robot has been tested, so that the team knows the strengths and weaknesses of the robot, and usually after the drivers have driven the robot a few times. The team must decide if the state of the robot is "good enough" to hand over to the Drive Team to practice on, which is a major decision as the Drive Team needs to be able to practice using the robot at some point. Remember, a great robot with a bad driver will always lose to a not-as-good robot with a great driver - just see Einstein 2024.

PARTS OF THE STUDIO

Shop

This is the larger room of the Rockin' Bots's robotics studio, often used by the build and mechanical subteams. It contains machine tools and work tables. It also contains items for the auto and industrial art classes, for we share the space with Mr. Doyal and his students. Safety glasses or other appropriate eye protection must be worn by a person in this area whenever they are working in the area and/or using a machine tool. There is also no eating allowed in the shop at any time. These two rules exclude the area of the shop in the area between the front door of the shop and the door to the lab. When one is working in the shop, he or she must keep his or her space clean and clean up when done. The shop must be completely cleaned up during the cleanup period before the end of the build day. The shop connects to the lab, loft, and classroom.

Lab

This is the smaller room of the Rockin' Bots's robotics studio, often used by the CAD, Design, Marketing/Outreach, and Programming/Electrical subteams. This room contains the team's desktop computers, a television, a whiteboard, tools, 3D printers, safety glasses, and the team's materials, from buttons to materials to create robots. The desktops computers, the television, and the whiteboard are on one side of the room, mainly used by the Design, Marketing, Programming, and CAD subteams. Food and drinks are sometimes allowed on this side of the room, as long as it is kept away from electronics and the room is kept clean. There is a limited amount of desktop computers in the lab, so the CAD team gets priority over them, while the Programming and Drive groups get priority for the laptops. The other side of the room where many of the tools are stored and where the robot sometimes gets worked on. This side of the room is often used by the electrical and build subteams, and no food is allowed on this side of the room.

OUTREACH ACTIVITIES

Local Schools (K-8th grade)

A select few student leaders along with the adult mentors traverse to various elementary and middle schools in order to give informative presentations, immersing younger scholars with the ways of FRC Robotics. We may display the functions of the previous season's robot, as well as distribute merchandise.

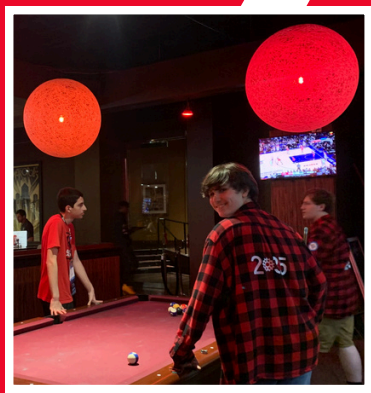
Within Carmel High

We attend club fairs annually to engage with students and promote school activities, participate in the Open House night to connect with prospective students and their families, and actively take part in school rallies, bringing excitement and energy with our t-shirt cannon to hype up the crowd and show school spirit.

MISCELLANEOUS EVENTS

End-of-Year Banquet

A banquet will be held to celebrate the end of the season at CHS or other location for members of the team to mark the end of another season. Recognition of individual achievements and awards will be given to students by mentors.



Volunteering

Various volunteering opportunities are available throughout the duration of the season, allowing the team to raise money whilst simultaneously promoting our team to the local community.

THE OFFSEASON

Competitions

During the off season, the team participates in optional, recreational competitions with the previous season's robot.

Local Outreach

Promote our team to the community, raise funds, and encourage participation for the upcoming season.Promote our team to the community, raise funds, and encourage participation for the upcoming season.

Training

We will use our shop to train newer members on power tools, metal-working techniques, coding, vision, and other useful skills and knowledge. This may take the form of reworking subsystems or aspects of the competition robot from the previous season, or may involve creating new robots of various sizes and levels of sophistication. The key idea is that we can use the offseason time to prepare all members for the upcoming season in a low-pressure environment.

Workshops

We may also hold workshops for 2035 members and members of other local teams where we provide tutorials on robotics topics that we know particularly well, such as metal work, vision, java programming etc. On the other hand, we may also elect to attend other teams' workshops during the offseason to enhance our knowledge base and connect with other teams' student members, which is a valuable resource during the build season.

Facilities Maintenance and Upgrades

The offseason is a good time for upgrades to our shop, including reorganizing tools and supplies, restocking crucial supplies such as aluminum for frames, chains, bolts, batteries, etc.

HISTORY OF
TEAM 2035

FRC Team 2035, The Rockin' Bots, was established in 2007 at Carmel High School by Paul McFlarin and Tom Clifford. Since its start, the team has been growing and allowing students to learn real life useful applications such as coding, wiring, designing, and engineering. The team has partnered with many other local teams, including teams 4171, 4255, 5104, 5171, and 6039, and has inspired an FLL team at Carmel Middle School.

Team 2035 has been recognized in many ways by the FIRST organization. During its first year, Carmel was a finalist at the U.C. Davis Regional Competition. The team has continued in this fashion, winning the Quality Award (2008), Creativity Award (2012), Control Award (2013), Inspiration in Engineering Award (2014), Chairman's Award (2016). The team won its first regional competition at the 2024 Monterey Bay Regional. Team 2035 has been invited to the FRC World Championship three times thus far (2014, 2016, 2024), and plans to work towards earning future invitations.

Team 2035 has and continues to help foster a truly well rounded STEM community throughout the Monterey Peninsula.

Contract for Team Members and Parents

The following contract must be signed by the 2035 student member and at least one parent or guardian for that student prior to engaging with the rest of the team during build sessions, competitions, and outreach activities.

Student Section

I, _____, a student member of FRC Team 2035, the Carmel High Rockin' Bots, have read and understand the behavior expectations described in the section titled Behavior Expectations and Discipline Structure in the Team 2035 Handbook. I agree to uphold those expectations and to strive for Gracious Professionalism, respect for people and property, and kindness in all of my 2035 activities.

Signed: _____

Date: _____

Parent/Guardian Section

I, _____, a parent or guardian of the student member above, have read and understand the behavior expectations described in the section titled Behavior Expectations and Discipline Structure in the Team 2035 Handbook. I agree to help my child uphold those expectations and to help my child strive for Gracious Professionalism, respect for people and property, and kindness in all of their 2035 activities. I also agree to uphold the expectations for parents and guardians of 2035 team members.

Signed: _____

Date: _____