TEAM 399:
PURPLE PRINT

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INTRODUCTION

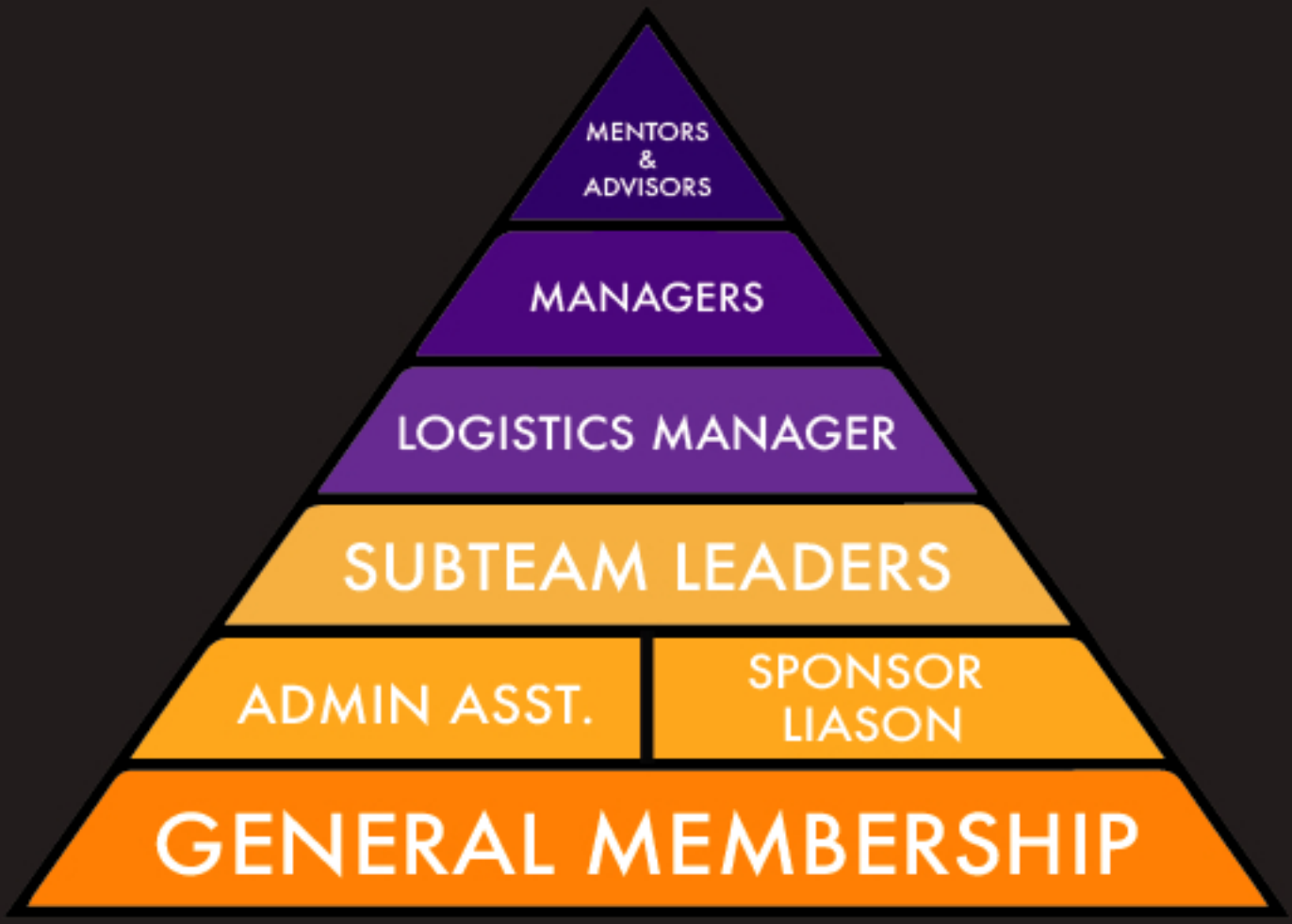
As a twenty year veteran FIRST team, Team 399: Eagle Robotics has acquired an expansive knowledge base concerning all aspects of running a robotics team. We realized that this experience helps each new generation of our team succeed, but can also be spread in order to inspire other FRC teams. For rookie teams, and those who have only been around for a few years, many aspects of running a team are new territory, and with no guidance it can be overwhelming. By organizing our experiences and what works best for us, new teams are able to learn from our mistakes. Instead of starting from scratch, teams are able to start with insight from a team with numerous years of failures and triumphs. It was this idea that sparked the idea of PurplePrint: a schematic to the structure and success of Team 399. This is the blueprint to everything that makes our team function smoothly, from leadership structure, to financial spreadsheet, to subteam trainings. We hope this guide inspires other FRC teams to dream more, learn more, and become more.


399

TEAM STRUCTURE

LEADERSHIP

Our leadership team is a group of students who were voted into their positions by their peers, and chosen officially by advisors. This group has the responsibility of running our 70 person team, with only guidance from our mentors and advisors. These positions have been changed over the years to fit the needs of our team. For example, logistics manager is a newer position, made so the team financials could be mostly handled by a student, as well as sponsor liaison, made so the team's funding would be more organized. Our team's large size creates a variety of leadership positions that often change every year in order to adapt to the culture.



Co-Managers

- Maintain the goals and vision of the team throughout the season
- Coordinate all activities that are generated by the team
- Facilitate and make agendas for both the general membership and leadership team meetings
- Coordinate the activities of the sub-teams through the sub-team leaders
- Communicate and coordinate with advisors, mentors, and parents.
- Track attendance and participation of team members
- Coordinate team bonding events
- Make meeting materials available to the General Membership as soon as practical

Logistics Manager

- Attend meetings for both the general membership and leadership team
- Submit a budget to the leadership team
- Coordinate all purchase orders for the team
- Keep a financial report of all income and expenses of the team
- Provide access to the financial report upon a proper request
- Coordinate team financials with the school accountant
- Coordinate the travel for team events as well as communicate with the school accountant for traveling
- Order all team apparel, including the year's spirit pack

Sponsor Liaison

- Attend meetings for both the General Membership and Leadership Team

- Interface with current sponsors along with developing new sponsor relations

- Plan fundraisers throughout the year

- Find and fill out new grants, as well as maintain previous grants

- Keep a list of current sponsors, grants, and fundraisers

- Update the leadership team of new sponsors, grants, and fundraisers

Administrative Assistants

- Attend meetings for both the general membership and leadership team

- Take and manage the minutes of all meetings for both the General Membership and Leadership Team

- Have Leadership Minutes published the following day after the meeting

- Manage the team email and update the Leadership Team of all correspondence

- Update our school's administration about what the team is doing monthly
- Update a Google Calendar with all team meetings and events

- Communicate with Multimedia in keeping the team website updated and correct

- Manage team roster with all contact information

- Collect information for and make sure phone card is made

Subteam Leaders

- Attend meetings for both the General Membership and Leadership Team

- Manage their respective sub-teams

- Train the members of their sub-team to be productive members

- Involve everyone in their subteam

SUBTEAMS

Over our twenty year history, our team has been split into many different subteams. Recently, we combined our Public Relation and Multimedia subteams into one, Graphics and Communication, since the PR and Media teams were small. After a year, we decided this was not for us, because their roles were too different to be one. We also changed our Programming and Controls System subteam into just programming, allowing the controls systems aspect to be handled by either Manufacturing or Programming. Separating our subteams is a trial and error process, trying to find the most beneficial way to split our team members.

MANUFACTURING

The Manufacturing subteam is responsible for the mechanical operation and design of robots, in coordination with Programming subteam. In addition, this subteam also handles any other projects which have mechanical or technical requirements, such as the building of sets.

PROGRAMMING

The Programming subteam is responsible for the programming of robots, the design of robots in coordination with Manufacturing, and Programming and control systems requirements of any other projects.

MULTIMEDIA

The Multimedia subteam is responsible for the team website, along with all media generated by the team, including but not limited to animation, video, graphics, photography.

PUBLIC RELATIONS

The Public Relations subteam is responsible for all event coordination, planning, and promotion.This subteam also communicates with the public, as well as current and potential sponsors, to ensure important relationships are maintained.

OPERATIONS

Team Requirements

General Members

- Have an unweighted GPA of 2.0 or higher
- Attend meetings,unless excused by a school absence or Advisor(s)
- Active participation in team activities
- Maintain a 50% average in total event attendance
- Have a satisfactory report from subteams leader
- Grade checks will be conducted at least four times a year
  Fall: Mid-semester, End of Semester
  Spring: Prior to Competition, Mid-semester

Membership eligibility for consideration to travel with the team

- Must be an eligible team member to travel
- No D's or F's
- Acceptable behavior and disciplinary record

Drive Team, Pit, and Chairman's Presenters

- Leadership Team eligibility
- One or more years on the team*

Team Building

Maintaining a team culture that supports and uplifts each member is an integral part of a functioning team. One way we keep this culture is through team bonding activities. These activities often take place around holidays, such as Friendsgiving or a Holiday Party. We also have team dinners during build season every Saturday,so members can take a break from the stress of working hard and spend time with their friends.

Communication Between Members

Slack is the main mode of communication between team members as well as parents. A Slack talk group containing all current members of the team is used to post updates on everything happening, including meetings and events. Different Slack channels are used to communicate more closley with smaller groups, such as the leadership team or those going to an outreach event.

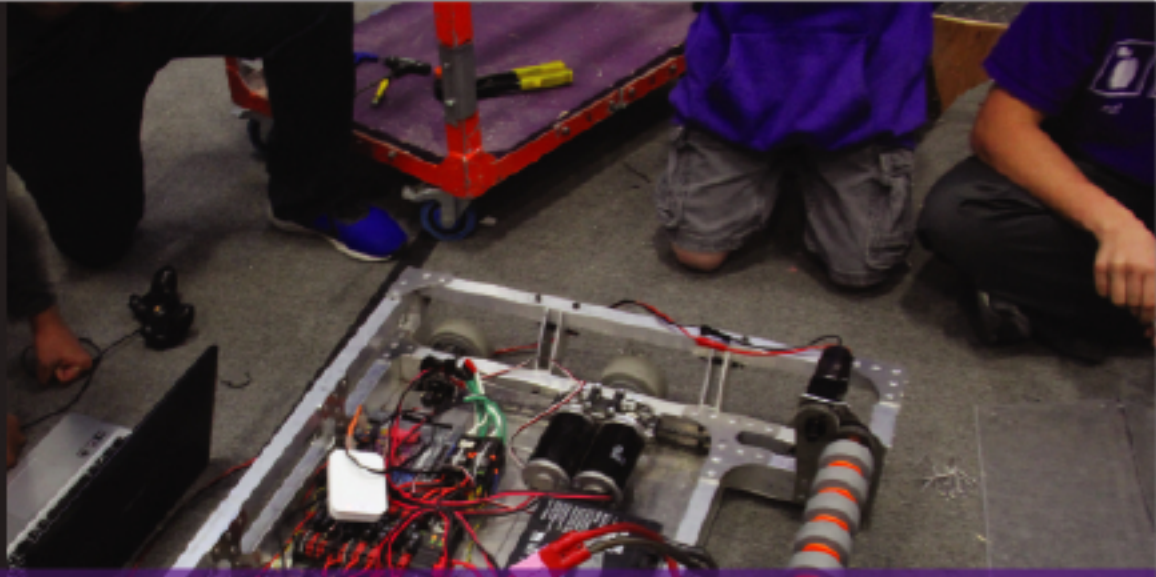
Outreach Hours

As an active member of our community, outreach events are a very important part of our team. In order to make sure these events are well staffed, certain amounts of outreach hours are required from each member. Rookies must get 35 hours, Veterans and Leadership must get 45 hours, and special jobs such as pit crew and Chairman's presenters must get 50 hours. Half of these hours need to be reached by the time build season starts, which is an achievable goal seeing as many of our outreach events are during the off-season.

EDUCATION

ROBOTICS UNIVERSITY

Robotics University is a series of classes made to educate new members, veterans, and even mentors. Classes are held to teach basic functions like how to use a drill and complex functions such as using the Bridgeport mill. These classes are hosted for all subteams to cover a variety of topics about Team 399 as a whole. Students and mentors have to attend classes as if they were attending a university, especially within their own subteam. These classes prepare our rookies and help our veterans to learn the skills they will need in build season. These classes allow new members, veterans, and mentors to become comfortable with all aspects of FIRST Robotics and Team 399.



CONTROL SYSTEMS

Our Controls System subteam bases its training with hands on learning

The Goal

```
Joystick driverRight = new Joystick(0);
Joystick driverLeft = new Joystick(1);
Joystick throttle = new Joystick(2);

TalonSRX righta = new TalonSRX(1);
TalonSRX rightb = new TalonSRX(2);
TalonSRX lefta = new TalonSRX(3);
TalonSRX leftb = new TalonSRX(4);
```

Team members take use of Robotics Roadshow intiative in an effort to learn basic concepts of robot code. As their own skills grow we challenge them with tasks such as programming a mechanism or creating autonomous code.

MANUFACTURING

When categorizing our manufacturing trainings, we break it down into three sections...

Easy tools

Easy tools are those which require little explanation and can be mostly taught through demonstration. Ex. Philips and flathead screwdriver

Medium tools

Medium tools are those which are slightly more difficult to use properly and require thorough training Ex. Impact drill

Hard tools

Hard tools are power tools which cannot be taught in a single session. Ex. Metal bandsaw and the mill

When creating trainings for every tool, there are certain elements which need to be included.

Concise description of the training

This allows students to prepare for what they're about to do

What is the tool

Some students in the training will be new to the tool, so a tool explanation is important

What is it used it for

Tools are made to use on certain materials, and telling members what these materials are ensures safety and tool longevity

Safety

Knowing what safety steps to take while setting up the tool, using the tool, and cleaning up the workspace is one of the most important things about these trainings. Knowing what possible dangers there are is necessary in order to avoid them.

Procedure to use tool

The complexity of tool procedures depends on its difficulty level, but thoroughly going over every tool, no matter how simple or complicated, is essential for retention of the training.

PUBLIC RELATIONS

When training, we focus on 5 main topics:

Event Planning

- Essential to spreading STEAM and FIRST

Public Speaking

- Key to successful communication

Team History

- Knowing our roots allows us to explain our growth

Social Media

- Promotes events and connects us with new audiences

Pit Outreach

- Showcases community outreach, sustainability, and entrepreneurship

For example, when we train our members to event plan, we focus on...

Our tasklist
In order to keep track of an event's planning process, we created a tasklist to assign due dates and keep track of what has and hasn't been done for the event. The tasklist keeps the planning process organized and opens up communication within the subteam.

Establishing the contact
In training, we stress how important it is to establish and maintain a frequent point of contact between the event coordinator and the main point of contact (if the event isn't located at your facilities). We teach that the way to maintain a healthy relationship between your team and the contact is frequent updates via email.

Necessary paperwork
Paperwork is a necessary part of every event planned and teaching our subteam how, when, and where paperwork needs to be turned in is crucial in a successful event.

Packing the N.E.S.T.
(Refer to N.E.S.T)

Team Sign-Ups
Having the personnel needed to run an event properly is essential to a smooth running event.

MULTIMEDIA

During training for Multimedia we focus on...

1. Adobe Creative Cloud Apps
2. Photography
3. Videography

For example, when training our members with camera safety, we go over tips of...

1. Make Sure the Battery Charger Matches Your Model
2. Only Use Approved Batteries
3. Check the Condition of the Cables
4. Don't Open the Camera Case
5. Store the Camera Minus the Battery
6. Don't let Batteries touch
7. Watch the Charging Process
8. Avoid Water
9. Don't Interrupt Processes
10. Choose a Storage Locale Carefully
11. Keep Your Lens Safe

STEAM OUTREACH

WORKSHOPS

Our team hosts workshops with the intention of providing the youth an insight of knowledge on specific aspects of robotics. For example, through our Drivers Ed workshop, we focus on immersing the participants in the world of drive team. Through our Eaglets program, we aspire to give younger students an idea of what the intensity of build season is like. It is workshops like these that provide the insight to younger students capable of inspiring them to join their own local FRC team in high school.

BOOTHS

In our community, our team frequently partakes in booths at a variety of community events. These booths are easy ways of creating quick but memorable reactions with the audience at the event. A one minute interaction between audience and booth is all it takes to make our team a memorable aspect of our community. Our booths typically feature our branded materials, such as our tablecloth, brochures, buttons, informational booklets, etc. Some events also feature an interactive components at our booth.

DEMONSTRATIONS

Demonstrations are the easiest and most efficient way to broaden our audiences. In our community, our team does a variety of demos at locations such as schools, our sponsor's facilities and community events. When choosing where to present our team, we envision what type of audience we would be reaching. The larger the audience the better, so in spreading our impact we choose locations that allow us to reach people of all ages and backgrounds. At these demonstrations we usually bring one of our robots. This can be a static display or moving robot depending on the space provided. We also get the chance to talk to the public about what we do, our organization, and what our team is all about.

EVENT COORDINATION

1 NEST, What is it?

The Necessary Event Supply Tote, better known as N.E.S.T, is a small initiative adopted by our Public Relations subteam in order to make packing for an event a simple and organized process. Too often has our team been found scrambling to pack for an event, struggling to find and keep track of everything needed. To combat this, we created the N.E.S.T. An easy, organized "to-go" box for events. Inside lies a sheet that is similar to an inventory sheet and a few items that are essential to practically all events we attend. The inventory sheet allows the coordinator of the event to track what is already inside and should be inside the tote. By doing so, packing for an event has become significantly easier. Some typical supplies kept in the tote no matter the event are:

1. Tablecloth
2. Brochures
3. Informational Booklets
4. Buttons/ Swag
5. Flyers

SUSTAINABILITY

While developing a presence as a team, it is crucial that community efforts remain consistent. As a well known team in our valley, Team 399 has had the opportunity to create events that outlast generations of students, ensuring that participants, their siblings, and even their future kids all get to experience the world of FIRST. Debuting new events that eventually become annual provide members of our community with reliable outlets of STEAM opportunities. This connection with our community also benefits our Chairman's efforts, allowing us to set up large initiatives for future members to continue with. Leaving a legacy, Chairman's initiatives are ever-evolving, expanding and being reimagined to reach new audiences year after year.

Necessary Event Supply Tote

Date	Name	Event

Available ✓ / X	Item(s)	Quantity
	Buttons	
	Tablecloth/Orange Drape	
	Signage	
	Tape	
	Scissors	
	Markers/pens/pencils	
	Swag	
	Informational booklet/ business plan	
	Brochures	
	Flyers	
	Awards	
	Business Cards	

ROBOTICS ROADSHOW

Robotics Roadshow is about giving everyone the chance to have a First Robotics Competition (FRC) experience. This is done through the usage of an easily transportable feild and robot.

The field is made up of individual two foot walls, which are connected through nuts and bolts. This setup of small walls that can be efficienty broken down and set up allows for convenient transportation in vehicles of any size. Another key function of the field is to provide an area that can adapt to any venue. Each venue is unique and has different spacial requirements that our team has to cohere to. The ability of the Roadshow is achieved by both the field and the robot. The robot was designed to be bigger than a First Tech Challenge (FTC) robot but smaller than an FRC robot. This provides the accurate FRC experience, while also being easy to transport with the needed mechanisms. Having interchangable mechanisms will accommodate diverse groups, giving different levels of challenges for participants depending on their age.

A vital part of a Roadshow is being able to provide an experience that anybody can enjoy, which is why having multiple configurations of the field and robot are important. Robotics Roadshow elevates the normal robot demonstration or static display into an immersive experience. We are able to show what we do on a level that resonates with all particiants. As our team members display their skills, whether it is fixing the robot, speaking publicly about our team, or photographing the event, we are showing the community what a high school FRC team can teach students, allowing others to participate with us. Robotics Roadshow is a way to spread enthusiasm about STEAM and connect with our community anywhere. There are no limits as to where Roadshow can go, the opportunities it can create, an influence it can spread.

PLANNING ROADSHOW

1 How to find locations

When choosing sites for Team 399's Robotics Roadshow, we often like to choose places where we can maximize our outreach to the public amongst several age groups. Roadshow is primarily targeted to younger audiences to engage their interest in Robotics and STEAM in hopes of recruiting them for the future. When the place of interest is decided and meets our requirements, we start by researching the different contacts through either websites, pamphlets, and through another connections with the venue. Having a point of contact and establishing open communication is a necessity to making sure things go smoothly and efficiently. We believe that demonstrating our team through public outreach such as Robotics Roadshow is of utmost importance and enables us as a team and individuals to spread our passion for science, technology, engineering, art, and math (STEAM) through our local, regional, and global community, so finding the best location leads us towards

2 How to run the event - Multimedia

Upon our arrival at roadshow location, multimedia focuses on a few things. Our main focus is Driver's IDs, which includes the process of taking pictures, transferring them to a template, and printing them out. We also have to document the event through pictures that show the meaningfulness of Roadshow and our community interaction.

BEFORE

1. Unpack your laptop and printer, along with the cameras and a tripod
2. Find an outlet to plug in your laptop and printer
3. Connect the laptop and printer through your cord
4. Open up your premade template for the Driver ID's on the laptop
5. Set up your tripod in an area with good lighting and a place to hang your backdrop
6. Test all equipment, taking a photo with your setup and creating/printing a mock Driver's ID

DURING

1.As participants line up, take their picture before they get to the driver's station
2. Depending on your ID template, transfer the pictures from the camera's SD card to the laptop
3. Place each picture on an ID and print them out
4. After each participant is done the driving, hand them their ID, and have them write their name on it
5. Repeat this process as quickly as possible so the IDs are ready by the time each participant is done
6. Throughout the event, other multimedia team members will be taking pictures of the event (participants driving, team members speaking to the public, etc.)

AFTER

1. Disassemble the photo station for Driver's IDs
2. Pack up all electronics, including the cameras, laptop, and printer

2 How to run the event - Public Relations

When you first get to the location of the event, if necessary it's important to face-to-face introduce yourself to the management of the location. Set up your table with desired aesthetic quality which will affect your audience's first impression of your team. Whilst at roadshow, Public relations is in charge of the "face" of your team. Represent your team well, be inviting and professional. Always be open to the public and talk to the people around! Let them know about what your team is all about

BEFORE

1. Find your point of contact, either with the event or venue and introduce yourself and the team
2. Unpack your N.E.S.T. along with any other necessary items
3. Set up your information table (either brought with you or provided by the event)
4. Place a tablecloth over the table
5. Put brochures, booklets, and other informational items in your desired aes thetic that is easy for the audience to interact with
6. Set up your display table (either brought with you or provided by the event)
7. Find an outlet to plug in an extension cord
8. Plugin your TV, and begin presenting
9. Place trophies, plaques, or awards next to the TV

DURING

1. Express enthusiasm to all participants and event attendees through friendly gestures and body language
2. Speak to people who approach your team's area, informing them about who your team is and why you do what you do
3. Answer any questions people may have, or direct them to someone who can answer them

AFTER

1. Disconnect the TV (along with any other electronic devices)
2. Disassemble your tables, packing them back into your supply tote as they were before

2 How to run the event - Manufacturing

As the team is arriving at the venue, setting up the field and robot quickly and correctly is important. After the field, robot, and driver's station has been setup, it is vital to continuously check up on the quality and safety of your area in order to maintain a smooth and efficient event. Along with maintenance, making sure that participants are actively enjoying themselves and learning while driving is what makes Roadshow a worthwhile experience.

BEFORE

1. Unpack all of your supplies for field, robot, and driver's station
2. Set up the field tiles in any desired color pattern
Assemble the field walls*
3. Place any challenge items on the field
4. Find an outlet to plug in your driver's station and battery charger(s)
5. Set up your driver's station, connecting to your robot
6. Run a systems check on your robot, making sure all desired functions are running properly

DURING

1. Place robot at the starting position
2. Take the first participant in line and introduce them to the controls of the robot
3. Explain to them the field challenges
4. Let them begin driving, with your drive coaches behind them, ready to help in the case of struggle or emergency
5. Allow the participant to drive for the allotted time, or until they complete the challenge
6. Congratulate them, and send them to the Driver IDs station to pick up their ID
7. Repeat this process in a timely manner, giving as many participants as possible a meaningful experience
8. Throughout the event, make sure to check on the robot, especially if you are doing this outside in the heat. Check the motor temperatures, battery charge, etc.

AFTER

1. Collect all of the challenge items and take them off of the field
2. Take apart the field walls and stacking them with care

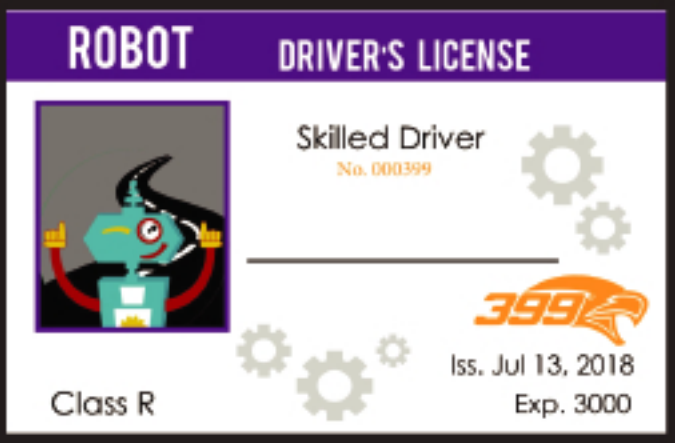
3 How to advertise

In order to create an event that reaches as big of an audience as possible, information has to be spread to the public. A good flyer will engage the viewer and encourage people to visit your event. In order to do so, you must use vibrant colors that correspond with branding, along with designs that attract the eye to vital information.

- Know your who, what, where, and when of your event
- Keep it simple and specific
- Stick with the branding guidelines to maintain a consistent public image
- Flyers draw your eye to specific information of the event, in this case Road show, so make sure this information:
    - o Includes the date, time, and location clearly
    - o Clarifies what the event entails

4 How to create Driver's ID

At our Roadshow events, we give Driver's IDs to each participant after their time driving. These Driver's IDs are created using a template, which our team uses Adobe Illustrator for.



5 Personnel

Drive Coach: (x2) each shift

- o Helps the participants drive the robot and complete the challenge
- o They must have past experience with driving the robot and be able to have positive interactions with younger kids

Field Reset: (x4) 2 for each shift

- o Is in charge of resetting the field after each session
- o They must have knowledge of how the field looks and should know how to put it back together

Mechanics: (x4) 2 for each shift

- o Helps the participants drive the robot and complete the challenge
- o They must have past experience with driving the robot and be able to have positive interactions with younger kids

Setup/Teardown: (x6) 3 for each shift

- o Sets up the field in order to get it ready for the event, and tears down once event is finished
- o During the event, these people can do miscellaneous jobs such as line management or field perimeter guards
- o They must know how the field is set up and be trained on all the tools used to put it together

5 Personnel

Public Speakers: (x2)
- o Speaks to the public about the team and the event
- o They must know about the team's history and be able to maintain a conversation with various people

Photographers (x2)
- o Takes photos of the event, documenting out interactions with the community
- o They must be able to properly use a camera

Driver's ID Photographer (x1)
- o Photographs the participants for their Driver's ID
- o They must know how to set up the camera with a tripod in the right position for each portrait

Driver's ID Creator (x1)
- o Transfers photos from the camera's SD card to the laptop in order to place them on the Illustrator ID template
- o They must be able to use Illustrator and the printer

6 Needed Supplies

Public Relations
- o N.E.S.T. (Necessary Event Supply Tote)
    - These are the basic supplies needed to run any event. More information is in the Event Coordination sub-section
        - TV
        - USB- contains videos, sponsors, slide shows, etc. to show on the TV
        - Table(s)*

Multimedia
- o Portable Printer
- o Laptop
- o Card to connect printer and laptop (USB Type A or Type B)
- o Tripod
- o Cameras
- o Backdrop

Manufacturing

Robot
- o Robot
- o Bumpers
- o Mechanisms*

Power
- o Batteries
- o Chargers
- o Voltage checker
- o Extension Cords

Field walls
- o Enough to go around the entire perimeter of the field
- o Field stabilizers
- o Extra connection pipes

Tools
- o 7/16 Wrenches
- o Hammer
- o Diagonal side cutters

Hardware
- o ¼" Bolts and Locknuts
- o Zip-ties

Interlocking tiles
- o Enough to span the floor of the field plus driver station area

Driver Station
- o Laptop
- o Steering components (joysticks, a wheel, etc.)
- o A table (if not provided)

HDLT

1 How we run HDLT

Coordinating and running our High Desert Lego Tournament is an immense responsibility. The planning for this event is done approximately a month and a half in advance.

1. Annually, we have held this event in our school's gym, so the first steps in planning are choosing dates, opening P.O.'s for expenses, and executing the proper paperwork needed for the facilities, security, and custodial services.

2. After all the paperwork is completed, the next biggest task is advertisement and participation. Our multimedia team puts together flyers for use of advertisement, which is then given to our public relations team to promote via social media and email. We contact teams who have participated in the past, teams who are signed up to attend the local AVTC qualifying tournament, and other new potential teams within a reasonable distance of our location.

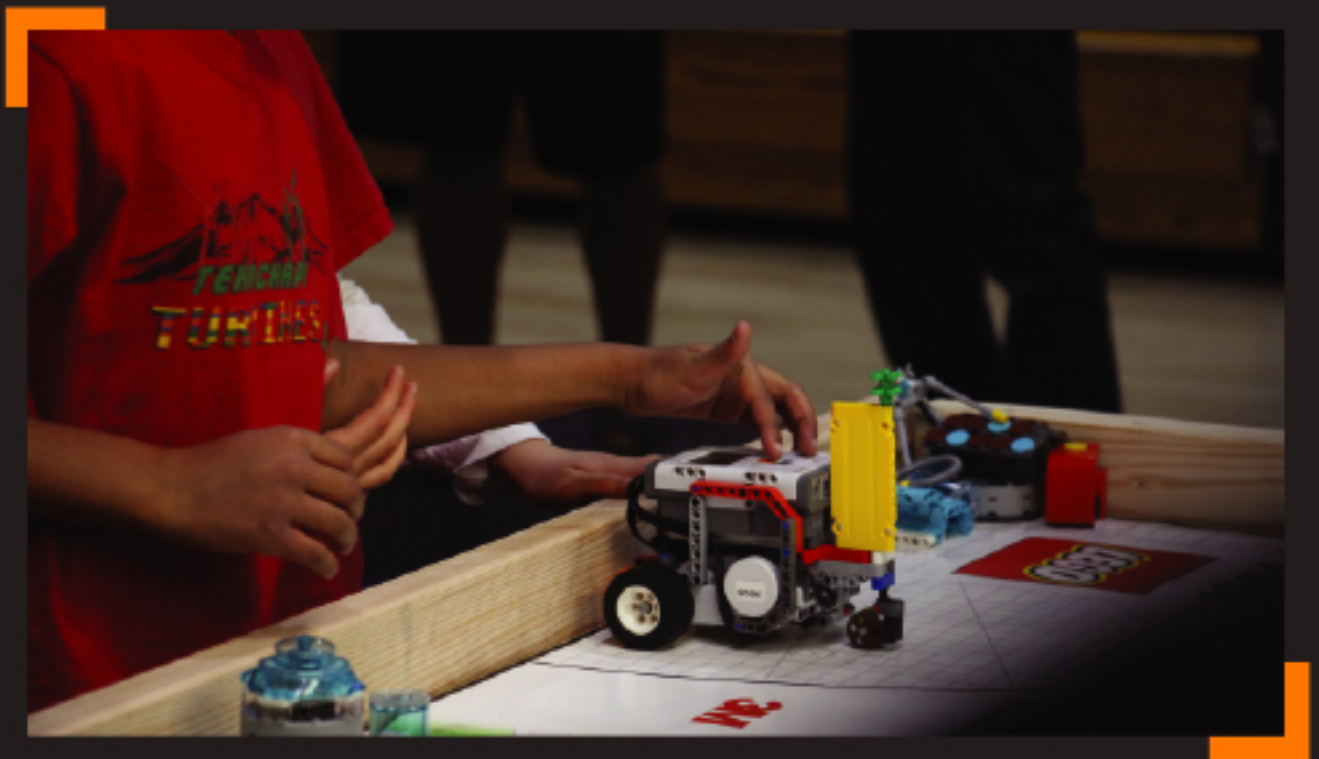
Simultaneously, a set is being designed to be constructed. Each year we have expanded the size and visual extremities of the set for HDLT, but typically we adhere to a 16' long set, and the height varies on how large of a screen we intend to place on top. After constructing a design for the set, we purchase the needed materials and our manufacturing team builds and paints the sets over the course of the next few weeks. Everything for the sets, including wiring, speakers, lighting, etc. is transported and assembled into the gym the day before the event takes place, as well as the pit area.

As for multimedia, during the set building process they are hard at work on pre-match graphics, signage, awards, and trophies. Logistically, during this timeframe, public relations team members are in charge of maintaining consistent communication efforts, sending confirmation emails to participants, answering questions via media, continuing promotion efforts, organizing our snack bar, and putting together a jobs list for those on our team and for those in the community who will be volunteering at the event. It is important that the volunteers are trained in their jobs, whether that be referee, field reset, runners, or judges. After finalizing schedules, jobs lists, and a master list of those participating, our event is set up for success.

Over a month of hard work contributes to this event's well being, and the organization of it is crucial to it's success the day-of.

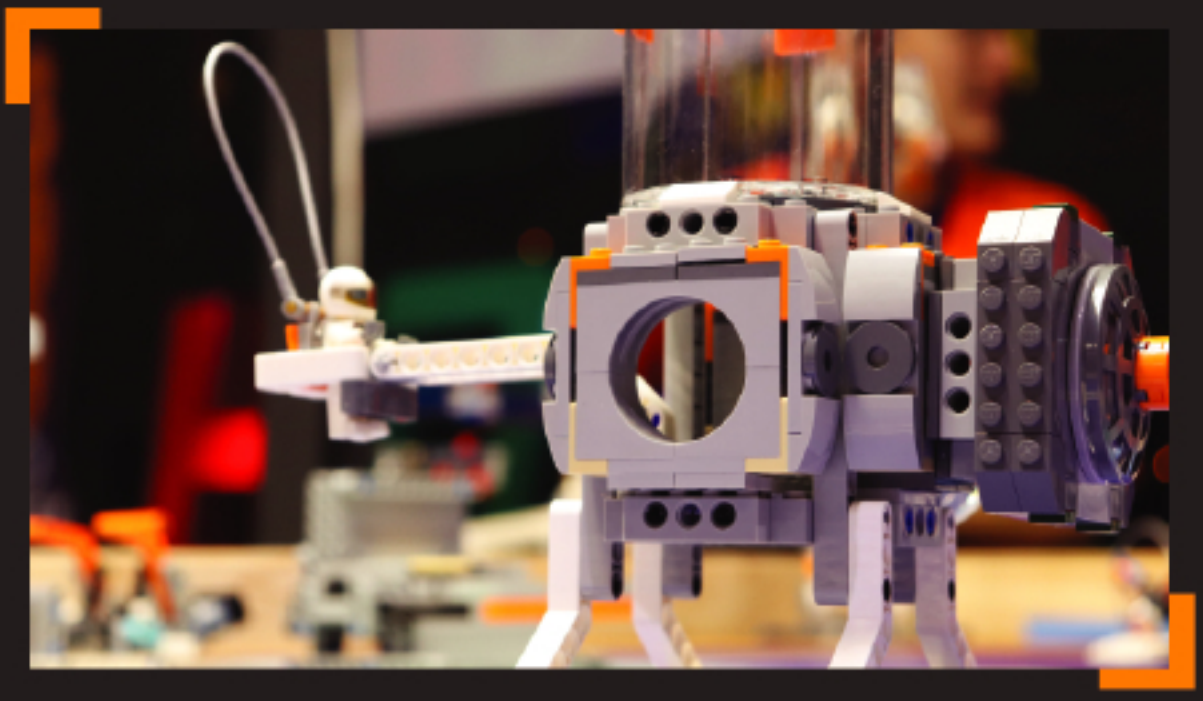
2 Why we run HDLT

Team 399's High Desert Lego Tournament and the Antelope Valley Techno Classic have both become substantially important to the youth involved in STEAM in our community. Helping these teams not only from our valley but those across California who attend these events is essential to our team's future, and the future of FIRST. By hosting and assisting such competitions that go above and beyond in regards to presentation and organization, our team is putting forth a consistent effort that the students, coaches, and mentors can rely on for years to come. The consistency allows for teams to return each year as their students grow within the world of FIRST. This well sustained pattern of growth keeps students engaged in STEAM and robotics. Through these events we are facilitating not only the growth but the connection between students and a passion for robotics, and this is important when considering that the students in attendance are potentially the world's future leaders. Students, coaches, and mentors rely on our team and these events for the well being of their teams, and by giving them what they rely on, we establish a connection with a strong foundation.



AVTC

The Antelope Valley Techno Classic is the FLL Qualifier hosted at Joe Walker Middle School. Our team runs AVTC annually, a couple weeks after hosting HDLT. By shortening the initial set we are able to make the HDLT set adapt to the size of the qualifier. Considering that many of the teams competing at HDLT also compete at AVTC, some minor additions and changes are made to graphics to adhere to this event. At AVTC our team supplies sound equipment and screens for projections of scores and match viewing. Once everything is equipped, the same jobs list is transferred to this event, and our team volunteers perform the same job they practiced and learned at HDLT. By connecting with these FLL teams not once but twice through both of these events, we form a connection with this lower division of FIRST, which is important to the continued interaction students have with FIRST. Being aware of and working with our FRC team promotes the idea that once these students grow to the high school level, they can be a part of an FRC team that volunteers in the same way we do, progressing a cycle of learning and spreading the FIRST Core Values from a young age all the way through their high school education.



CONNECTIONS

C.O.R.E.

Our Coalition of Robotics Educators (C.O.R.E.), began as an idea to start robotics team at every high school in our district, and provide a network of support for all advisors that included the district. By proposing our idea in front of district officials, explaining the benefits of providing robotics opportunities for every student in the district, we were able to make C.O.R.E. into something valuable. Now, we are aiming to expand this idea even further by introducing it to middle and elementary school districts, so students of all ages in our area can gain experience with robotics and STEAM, and can follow their passion all the way through high school.

Why did we start C.O.R.E.?

The Antelope Valley Coalition of Robotics Educators (C.O.R.E.) consists of robotics advisors that collaborate with district support to expand and integrate STEAM into high school education. Each advisor comes from a different team, and in turn a different high school, and have varying levels of experience with robotics and FRC teams. District officials are also involved in the coalition, providing substantial support to uplift the members. Starting C.O.R.E. was a necessary step in order to expand the reach of FIRST and STEAM in the Antelope Valley area. By working with our school district, having FRC teams accessible to any high school student in the valley is becoming a reality. Not only can we start these teams, but we can provide them with a support network, where advisors can voice their concerns and receive advice and tangible aid. This aid comes from fellow teams, contributing their materials or instruction, or from the district, contributing subsidies like regional registration or advisor incentives. By involving the school district in our robotics outreach efforts, our team is able to get more people involved and invested in the idea of giving students the opportunity to experience robotics firsthand, and reap the benefits it provides.

How we started C.O.R.E.

The main focus when the idea of C.O.R.E. first began was to garner district support for robotics and STEAM programs in the area. In order to do so, we crafted a plan that started with setting up a presentation through our school district's Director of CTE, explaining the Coalition of Robotics Educators to district officials. The presentation included the objectives, costs, benefits, challenges, and support provided on both the team and district level. By providing information tailored specifically to our own high school district, we demonstrated that the plan was thought-out, organized, and attainable. Often times district officials want to support STEAM programs in their schools, and by giving them a direction to go in, we equipped them with a course of action that allows them to do so.

Our goals for C.O.R.E.

When the idea of C.O.R.E. first came to be, our goal was to bring FRC teams to every high school, and have the district provide support help sustain them. But after we started these teams, we realized that our robotics outreach includes more than just high school level programs. By extending the C.O.R.E. initiative to middle and elementary schools, we could create a pathway so that kids who find their love for STEAM early on can follow through with it. Each set up elementary schools funnel to certain middle schools, who go to certain high schools, and some of these schools have STEAM programs, while others don't. By having a disconnect between levels, it creates a system where kids accumulate interests in robotics or engineering, then have nowhere to go to gain more experience with it. Creating a network of all school districts, a coalition of robotics educators that spans all levels of education, our area can provide all students with a FIRST experience, whether it be FLL, FTC, or FRC.

AV CORE
Coalition of Robotics Educators

SPONSORS

Importance of Sponsors

Sponsors not only provide monetary support to a team, but also provide connections throughout the community, mutual relationships. Many times, sponsors who provide support ask for demonstrations of the team's effort in return. For example, one of our sponsors, the Lancaster West Rotary, asks us to perform a demonstration and presentation about our team to the members of the rotary. Demonstrating team efforts to sponsors show that their money is not going to waste, setting up a good relationship so it continues for years to come. Also through sponsors, a team can meet other potential sponsors, create a network of connections, and spread the message of FIRST. This can all be accomplished by reaching out to new sponsors and maintaining relationships with old ones.

How to get Sponsors

Obtaining sponsors can be done in a multitude of ways. Local sponsors are gotten by reaching out to local businesses or people who are connected to robotics, STEAM, and/or FIRST. Sponsorships can be monetary, but they can also come in the form of donations of items to be used by the team. For example, our team is sponsored by Solidworks, because we were given Solidworks keys for free, and our school district, because they assist us with paying for regional registration. Often times, giving a robot demonstration and a small presentation about the team helps give tangible evidence as to what a robotics team does, and why sponsorships are necessary. Reaching out to organizations and explaining the mission of a FIRST robotics team is what helps diversify funding by convincing others that it is worth it to donate money or materials.


NORTHROP
GRUMMAN


NASA


ITEA


SANTA CLARITA COMMUNITY COLLEGE DISTRICT
COLLEGE OF THE CANYONS


ANTELOPE VALLEY
FAIR ASSOCIATION
Lancaster, California


ANTELOPE VALLEY UNION
HIGH SCHOOL DISTRICT


KALIBER 9


DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA


AndyMark


ROTARY
INTERNATIONAL


SendCutSend


SOLIDWORKS


3DPrinted
Debris


UPLINK COMMUNICATION TECHNOLOGIES
VOICE & DATA SERVICE

ROBOPROM

Roboprom is an annual event that Team 399 holds every year during the competition season. Houston and Detroit championship often always fall during prom season for a majority of our high school teams. Fortunately, Team 399 has started an initiative over ten years ago that continues to allow them to provide the FIRST family with not only the experience but the memorable moments they may not get to have because of their dedication to robotics. This event acts as a stress reliever for the teams working hard on the rigorous days at championships. Roboprom has grown into becoming one of the biggest fundraisers for Team 399. Roboprom is accessible to both FTC and FRC teams in Houston, Texas and Detroit, Michigan. For the past ten years we, as Team 399 have been lucky enough to build Roboprom into an event that hosts over eighteen-hundred kids and making it one of the best highlights of championships as a FIRST family.

When planning Roboprom, we consider the following:

- Proximity to the competition venue
- Maximum capacity
- Availability
- Budget
  - Venue, DJ, Photobooth, Decorations, Food, Wristbands, Crowns
- Scholarships
- Court
- Ticket sales
  - Where we sell inside the venue, pricing

ROLLOUT

Our annual Robot Rollout media event showcases our newest robot to the public at the end of build season. Engaging the community in our build season efforts with a large visually appealing set and professional script, Rollout recites what FIRST is, the year's game, and introduces our team and it's members. During the presentation, we also reveal our Chairman's video. Our robot rollout acts as much more than simply a robot reveal.

Who goes to this event?

To this event we invite not only the public, but school and district administrators, local leaders, and representatives of our sponsors. This event connects our team to the audience that supports us endlessly: our community. Celebrating the hard work and efforts applied during the build season, Robot Rollout is a valued event that ultimately is much more than simply a robot reveal.

What goes into planning our annual Rollout?

- Custom Invitations
- Design/Manufacture a Set
- Create the screen graphics
- Script

TEAM FINANCING

FUNDRAISERS

An important part of keeping a financially stable team is hosting fundraisers. These fundraisers can be eating at restaurants, going to entertainment centers, selling community cards, or hosting things like a yard sale or car wash. Each type of fundraiser requires different levels of effort from members. Going to a restaurant which donates a portion of the sales is easy, whereas getting members to sell cards is more difficult, and the most difficult ones being those which require members to work the event. Deciding when to do fundraisers is important, taking into consideration what else goes on that day or week, for member availability. Our team aims to hold one fundraiser per month, to create a consistent source of income. Some fundraisers make more than others in general, but many times the amount made is dependent on the amount of advertising done. Making sure that flyers are distributed and posted on online ahead of time is vital to a successful fundraiser.

GRANTS

When looking for grants, the key is to find a person or place that wants to support the spread of STEAM education. As a robotics team, that is the main mission, and getting support to advance your program is vital. While many grants fit this profile, Team 399 has had the most success with local grant applications. Reach out to local school district officials, business leaders, and industry partners to inform them of your desire to apply for any grants they may be aware of. Additionally, know who the target applicant is for each grant. Some larger organizations will not sponsor individual teams. If you find grants that are tailored to a smaller organization, such as an individual team, and you can demonstrate how their grant money will be supplemented with your other fundraising efforts, you will be on your way to success.

TRAVEL

Choosing Regionals

In recent years, our team has been going to three regionals every travel season. The logistics of choosing is made slightly easier due to the fact that we have a home regional, AVR, held at another high school in our district. This leaves us to decide only two other regionals. The first step is looking at the list of possible regionals, and what weeks they are. Having regionals that are spread out over the season, such as Week one, three, and five, or two, four, and six, allows for more robot and Chairman's practice in between competitions. Weeks are also important when looking at in-state versus out-of-state regionals due to travel time. Going to out-of-state regionals also has a greater cost because of extra hotel days and transportation. Deciding which regionals to go comes down to the financial status of the team and travel logistics.

Hotel and Transportation

After getting into our regionals, the next step is booking hotels and transportation. The average number of members that we take is about thirty. Taking more students means that more hotel rooms need to be booked, but the cost is split evenly between the four people per room. Also, if more members go and a bus is taken to the regional, the cost is split among more people, lowering the cost. On the other hand, going out-of-state and bringing more people often means greater cost of transportation due to the cost of airfare. Transportation to regionals is a main source of cost, so considering options is important. Although it may be easier to fly out of state, it may be worth it to consider taking a bus. Along with transportation, choosing hotels also has many factors to consider. Hotels which are closer to the venue may be slightly more expensive, but allow members to have a short walk every morning and evening to competition. Those farther away from the venue either have longer walks, or require transportation to and from, which increases cost. Overall, hotel and transportation both in- and out-of-state necessitate careful considerations in order to make the most cost efficient decision.

Cost

A major factor of travel is cost. Hotel, transportation, and regional registration all need to be paid for, and the expenses are split between the team and students. The amount that students must pay for travel depends on the financial state of the team. Paying for about half of the regional costs is a fair split for students, but if the team cannot afford to pay that amount, then the percentage the team covers will decrease. Finding a price which is both sustainable for the team and doable for students is key, and fluctuates every year depending on the amount of fundraising and sponsorships that were earned.

SPONSORS

Running a competitive robotics team requires funding, and sponsors are one way to ensure a team is able to be sustained. All sponsors are important, no matter how much the donations are for. Ideally, a team should have diverse sources of funding, so that if one sponsor falls through, the team can still be financially well-off. Sponsor funding goes towards everything the team does, from robot parts, travel subsidization, and outreach event supplies.

ROBOT

PROTOTYPE

Our team uses the Engineering design process to ensure that we are efficient and creative in our robot design. By teaching all of our new recruits how to effectively utilize the process our team is able to fabricate a robot designed for success. To begin we start by using wood and other easily modifiable materials to create prototypes which we then test rigorously, making adjustments wherever needed. This is one of the most important parts of our design process, helping us innovate new and creative designs. After a sufficient prototype is created we implement it into our robot, eventually finalizing the robot after any necessary changes.

BUILD SEASON

Off Season

Although build season is the main focus of FIRST teams, offseason is just as important for robot, media, and outreach success. Offseason starts once travel season ends in April, and lasts until January when the next build season starts. These nine months are vital for the training of new rookies and progression of veteran members. In order for training on machines or programs to be retained by all members, information must be continuously reviewed, which offseason allows for. If this time is utilized correctly, by the time January rolls around the entire team will be confident in their abilities and will be able to be relied on to do work efficiently. Not only is the offseason used for training, but our team also uses it to conduct major outreach events, since we are able to dedicate more time to them.

Build Season

Manfacturing

During build season, Manufacturing is split up into two major groups. The first group is the design team, who focuses on prototyping for the first few weeks, and then moves onto CADing and fabrication. The second group is the one who builds the field elements of the year's game for the first part of the season, and then moves on to build the set for our Robot Rollout in late February. These groups are created based off of interest, those who want to work on the robot are on design, and those who are more interested in woodworking build the field elements and set.

Control Systems

During build season, our programming subteam works very closely with the manufacturing design team. Developing the plan for autonomous code is the main focus for the first part of season, as well as giving input for robot design and mechanism integration. Once the robot is being fabricated, Programming does most of the wiring so that they are familiar with the system for when they start coding. For the rest of the season, the subteam focuses on applying their autonomous code as well as teleoperated code.

Multimedia

During build season, Multimedia focuses on making our booklets, brochures, and videos. These products include our Informational Booklet, Informational Brochure, PurplePrint Booklet, weekly recap videos, and Chairman's video. Gathering all of the needed information and putting it into a cohesive and attractive format takes time, and it takes our entire media team to accomplish.

Public Relations

During build season, Public Relations's main focus is Chairman's, Robot Rollout, and Roboprom. Writing the Chairman's essays and video script, as well as designing the presentation is the focus for the first few weeks of build season. Our Robot Rollout also requires a script, and invitations to be sent out to our community. Houston and Detroit Roboprom demand a lot of Public Relations's attention as well, coordinating all of the different aspects. Other small outreach events are also planned through communication with the event lead and rest of the team.

CHAIRMAN'S

ESSAYS

How to split the essays

Chairman's writing consists of one main essay, along with twelve executive summaries. It is important to involve many people in the writing process, not only to be inclusive and provide members with the opportunity to our Chairman's effort, but also so they can provide input to further improve the essays. Usually, the main essay is written mostly by our Public Relations subteam leader, with help from other PR members. Each executive summary is assigned to one person, who provides a rough draft that other members can go over. After members review the essays, they are passed onto mentors and advisors, to check for accuracy, grammar, spelling, etc. This process ensures quality essays while also not putting the entire workload onto one person.

PRESENTATIONS

Making the presentation

When writing the Chairman's presentation script, our presenters start by outlining the main points to talk about. These main points are our team's most important events and initiatives in recent years. Once the points are decided, the introduction is written to set the tone of the rest of the presentation. The order of the main points is then decided, and the presenters go through each one and write its paragraph. In the conclusion, it is important to make sure you give a brief and clear recap, and clarify the purpose of the team's outreach efforts. After the script is written, each presenter reads through so it can be decided who reads which ones the best. The order of who speaks determines the presentation's choreography, which also corresponds with our Chairman's board. Each year, we try to improve our board to make it more dynamic and entertaining, while also keeping with the theme. In 2019, for example, the theme for our presentation was about spreading the seeds of FIRST, and our board was an interactive tree. Writing the script, making the board, and creating the choreography are all important parts of preparing for the competition, but practicing is just as vital. Practicing with all finished components allows presenters to become comfortable with their portion and lead to an even better presentation.

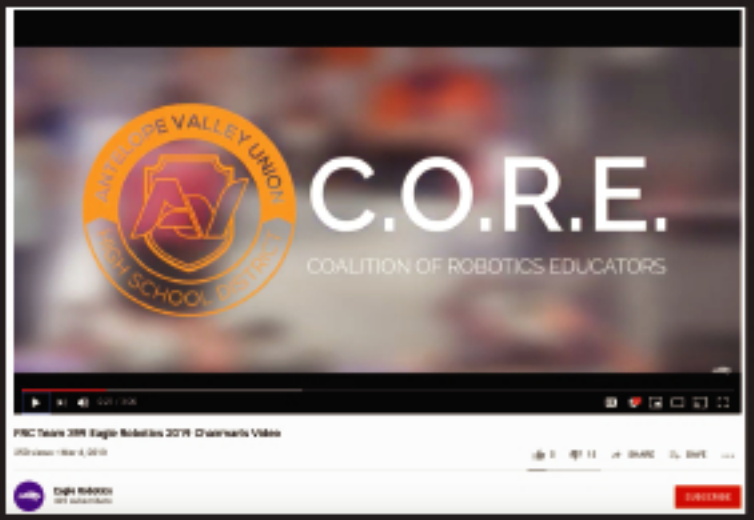
How presenters are chosen

Our Chairman's team consists of three presenters and one substitute. These four members are chosen through tryouts, judged by our advisors and mentors. Our judges use a rubric that is broken down into four categories: memorization, verbal delivery, non-verbal delivery, and knowledge about the team. Each category is worth four points each, leaving each score to be out of sixteen points. Although the rubric is the main source of scoring, judges also consider members' dedication to the team, since our Chairman's team must be dedicated to coming in consistently the entirety of build and travel season. Along with dedication, grade level is also considered in order to ensure sustainability. If we had all senior presenters, next year's team will not have experience presenting at competition, but also newer team members have less knowledge about the team. All of these factors come into play when choosing our presenter team, allowing us to assemble the best Chairman's team possible every year.

Element	Score	Comments
Memorization	1 2 3 4	
Verbal Delivery (volume, phrasing, pace, pronunciation, etc.)	1 2 3 4	
Non-Verbal Delivery (eye contact, facial expression, posture, etc.)	1 2 3 4	
Q & A - Knowledge of FIRST and Team 399, personal connection to robotics, thinks on their feet, etc.	1 2 3 4	
Total:	16	

VIDEO

The Chairman's video is the visual which brings together the main ideas of the outreach efforts of the team. The first step is writing the script based on the main essay and presentation. The video script is usually more vague than the other two, mostly just providing the basic information while conveying the emotional aspect of outreach. Once the script is written, the footage then has to be chosen based on the content being discussed. Major points should have corresponding footage, for example when we talk about Robotics Roadshow in our video, we show video of children driving our Roadshow robot. Any abstract lines can be represented with any B-roll footage that supports the main idea. Motion graphics, animations, and transitions can also be added for extra effect. The footage, extra effects, and music all combine to bring together the ideal visual experience to represent the purpose of Chairman's.



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DREAM MORE. LEARN MORE. BECOME MORE.

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