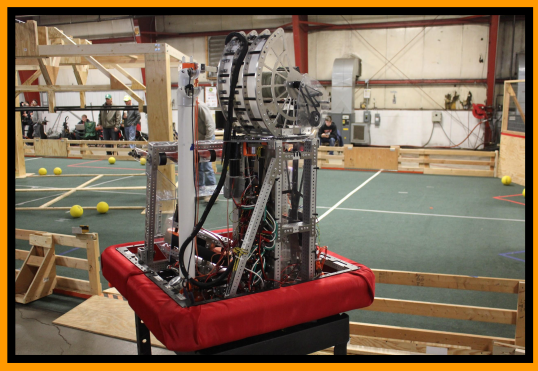
2020

Team

Neutrino

FIRST Robotics Team #3928



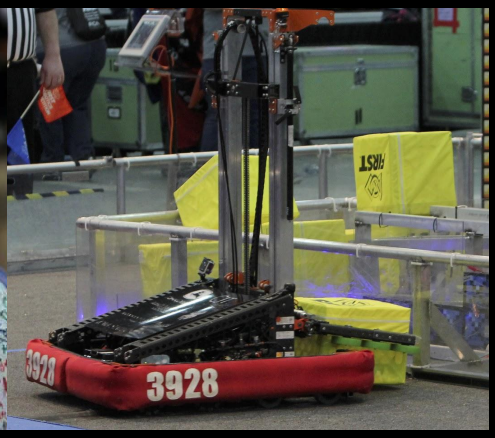
INFINITE RECHARGE℠

What's FIRST®?

FIRST is a non-profit organization that designs fun, motivational programs to help young people in grades K-12 discover and develop a passion for Science, Technology, Engineering, and Math through challenging robotics competitions.

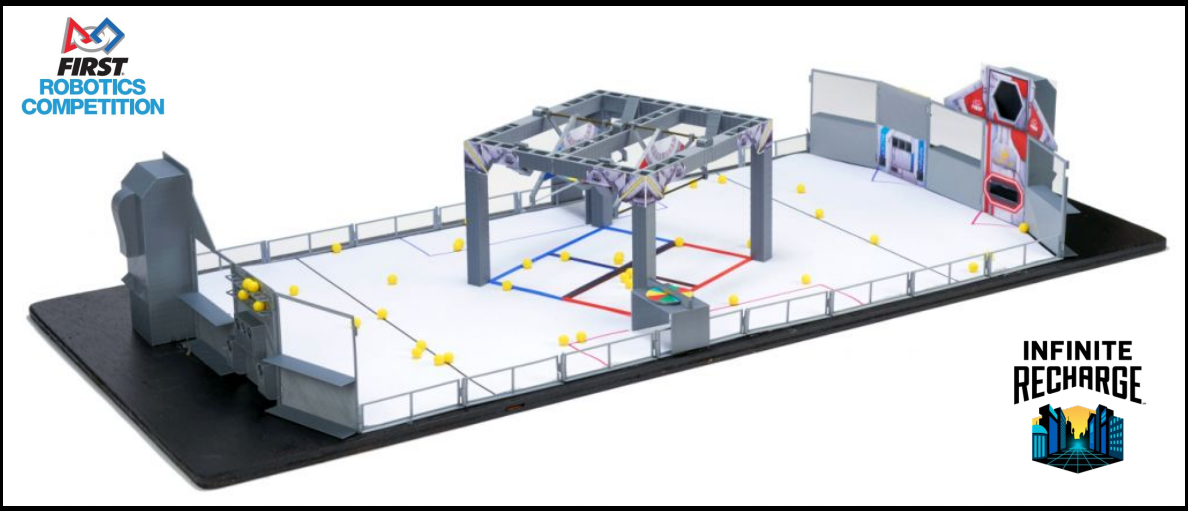
The Mission of FIRST®

to inspire youth to be the science and technology leaders of tomorrow by engaging them in exciting Mentor-based programs that build their skills, inspire innovation, and foster well rounded life capabilities including self confidence.



INFINITE RECHARGE

The INFINITE RECHARGE game involves two alliances of three teams each, with each team controlling a robot and performing specific tasks on a field to score points. The game centers around a futuristic city theme involving two alliances consisting of three teams each competing to perform various tasks, including shooting foam balls known as Power Cells into high and low goals to activate a Shield Generator, manipulating a Control Panel to activate this shield, and returning to the Shield Generator to park or climb at the end of the match. The objective is to energize and activate the shield before the match ends and asteroids strike FIRST City, a futuristic city modeled after Star Wars.



Team History

Team Neutrino started with one of our students being invited to attend the Minnesota North Star FRC Regional by her grandfather, a mentor on team 2977, Sir Lancer Bots. After being inspired by the mission, community, and the competition, she decided it would be great to have an FRC team in her area. She began with her school's engineering club and wrote a proposal to the principal. After gaining permission to be a club, it became apparent that the team needed a coach, mentors, and LOTS of funding. With the help of her mother, the team applied for JCPenney's grant for rookie teams. After contacting the regional director for this information, they connected with a student at Iowa State University looking to start a FRC team. It was a match made in heaven. The team then started having meetings to work out details such as how the team would run, space issues, and funding issues. After this, the team was ready to add students. They spread the news that Ames, Iowa had brought back a *FIRST* Robotics Competition team. Team Neutrino then gained the dedicated mentors, students and coach of the 2012 season.

After the 2012 season was over, the team's main workspace at Ames High School was disbanded so alternative plans were needed. Fortunately enough for the team, they were invited to join the Story County 4-H Program as Iowa's first 4-H FRC Team! The team was excited to partner up with ISU Extension and Outreach for that year, as well as all future years.

2013 Team

At the Kansas City Regional the team was ranked 9th, chosen to play with the 2nd seeded alliance, and recipients of the Excellence in Engineering and Finalist awards. At the North Star Regional the team was undefeated during the qualifying matches, finished as 1st seed, and won the Innovation in Control and Finalist awards. The team was honored to participate in the Indiana Robotics Invitational with 68 of the top ranked teams in the world. At the end of the 2013 season Team Neutrino was ranked in the top 3% of teams worldwide.

2014 Team

At the North Star regional, the team was awarded Engineering Inspiration, which is given to the team with outstanding success in advancing respect and appreciation for engineering within their community. This award earned Team Neutrino a paid trip to the World Championships in St. Louis! In St. Louis we had a win-loss record of 6-4, and during alliance selection we were picked to be the 4th robot on the 4th seed alliance (in the Newton division)! We ended up being semifinalists on the Newton field (similar to the Sweet 16 in March Madness).

2015 Team

For our 2015 season, Team Neutrino went to the Central Illinois and North Star regionals. The team placed as quarterfinalists in both, and team member Dagney Paskach won the Dean's List Finalist Award at North Star. During the off-season event CowTown ThrowDown, Team Neutrino was chosen by the 2nd seeded alliance and won the event.

2016 Team

In 2016, Team Neutrino went to the Minnesota North Star regional and the Iowa regional! The team was a semifinalist at North Star and a quarterfinalist at Iowa. The team had the honor of winning the Judge's Award at the competition.

2017 Team

In 2017, Team Neutrino went to the Minnesota North Star regional and the Iowa regional. The team was a quarter finalists at Iowa and a semifinalist North Star. At Iowa, team member Rucha Kelkar won the Dean's List Finalist Award. At North Star, Team Neutrino won the Chairman's award, sending the team to the world championships! In the offseason, the team built a minibot to compete in the East Metro Cooperative Competition.

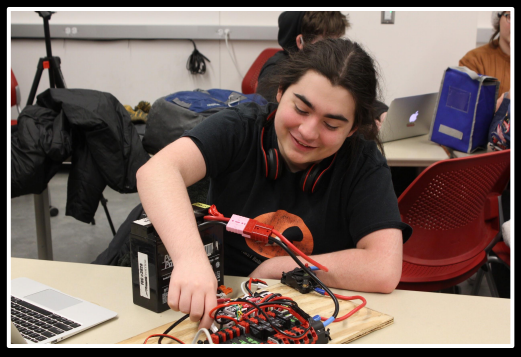
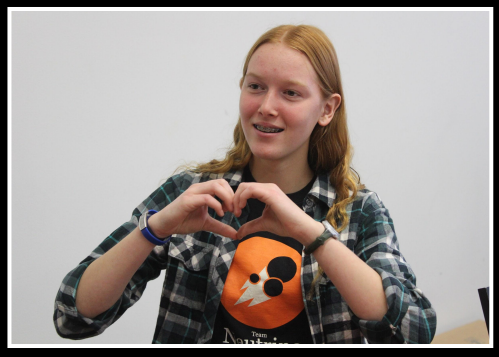
2018 Team

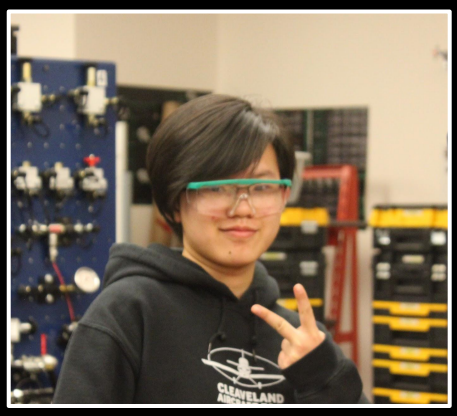
In 2018, Team Neutrino went to the Seven Rivers Regional and the Iowa Regional, where they were the 2nd seed alliance captains, finalists, and recipients of the Engineering Inspiration award. This qualified the team for the World Champs in Detroit, where they were the 7th seed alliance captains and quarterfinalists.

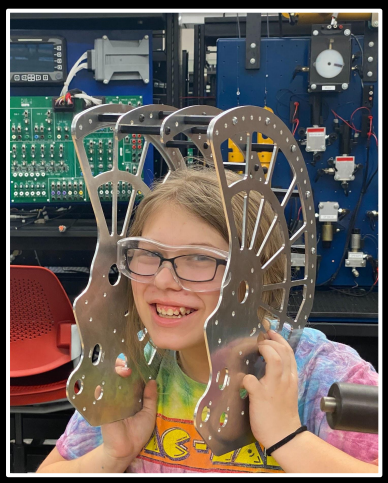
2019 Team

In 2019, Team Neutrino attended the Iowa Regional, Seven Rivers Regional, and the Detroit World Championships. At Iowa, the team was seeded 3rd, with Nitzan Friedberg named a Dean's List Finalist and the team winning the Quality Award. At the Seven Rivers Regional the team won the Engineering Inspiration Award.

Meet the Team!

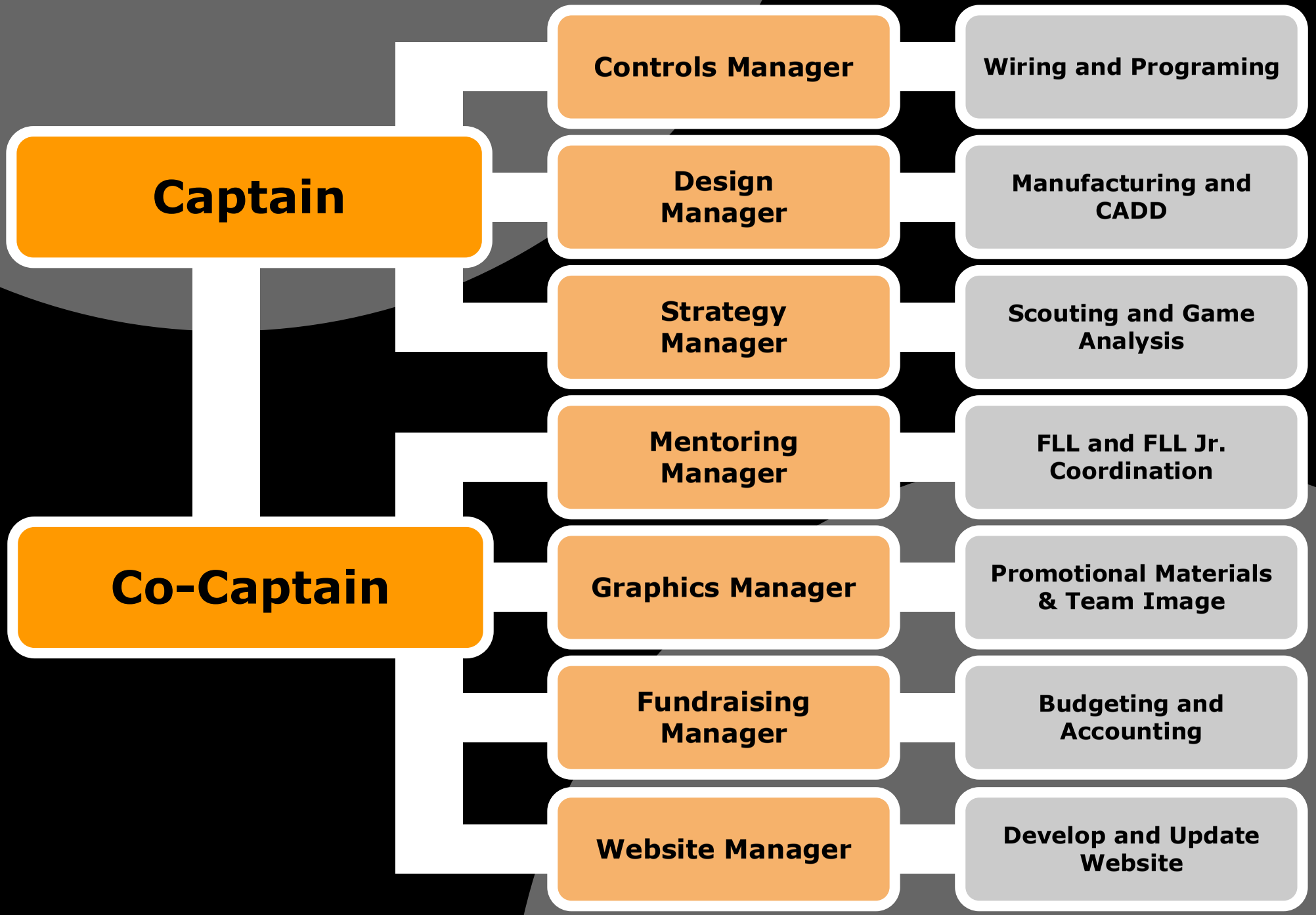





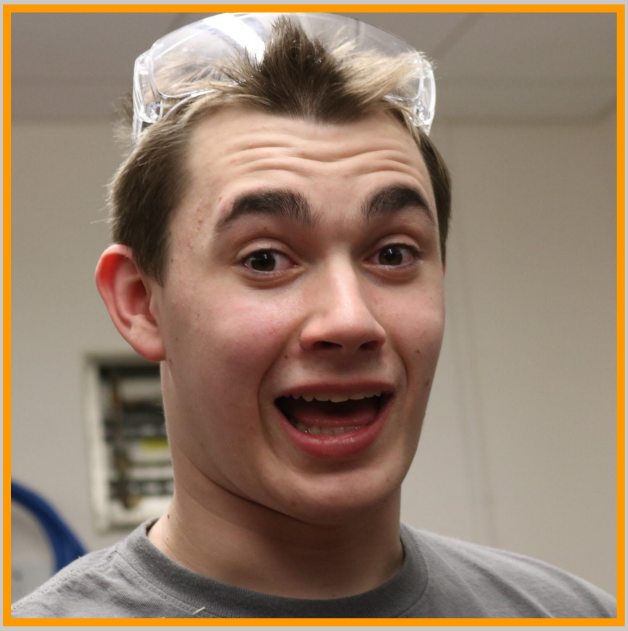



Team Management 2020

Team Organizational Structure Diagram



Captain
Sayre Satterwhite



The Team Captain oversees all happenings on the team, focusing more on the technical subteams. It is their goal to focus, motivate, and keep the team on track towards goals. The Team Captain works closely with the Co-Captain to institute the values of FIRST and keep the team working as a whole.

Captain & Co-Captain

Co-Captain
Claudia Murphy

The Co-Captain oversees all things non-technical. They are in charge of making sure awards are submitted on time and that all non-technical projects are making headway. The Co-Captain needs to be organized and is in charge of making sure all non-technical activities are documented to ensure sustainability.

Design
Simeon Steward

The Design Manager oversees CAD, prototyping, and manufacturing of the robot. It is their duty to help make design decisions and delegate duties out to members, as well as reporting progress during the season to the team Captain.

Design and Controls

Controls
Nitzan Friedberg

The Controls Manager oversees programming and the wiring of the robot. It is their duty to help make design decisions and delegate duties out to members, as well as reporting to the team Captain progress during the season.

Graphics
Lauralee Thach

The graphics manager is in charge of the team's image and making sure that the team image is recognizable and consistent from year to year. They help organize the tasks that graphics does, including videos, newsletters, annual report, and pit binder.

Graphics and Fundraising

Fundraising
Matthew Hehr

The fundraising manager is in charge of raising money for the team and maintaining contact with sponsors. They also maintain the overall team budget and acts as the primary contact for sponsors.

Strategy
Steve Frana

The strategy manager is the lead scout at competitions. It is their job to create the team's scouting system, train the scouting team, and lead strategy discussions.

Strategy and Mentoring

Mentoring
Claudia Murphy

The mentoring manager coordinates Team Neutrino's FLL and FLL Jr. teams. It is their job to oversee all of the student mentors and ensure the FLL and FLL Jr. teams are running smoothly.

Marketing

2020

Sponsorship Letter

Team Neutrino

FIRST Robotics Team #3928

To our business community:

Background and Mission

Team Neutrino faces the exciting challenge of building a robot to compete in FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition events. Established in 1989, FIRST is an organization with four programs for kids from kindergarten to 12th grade which provides STEM education and experience in an exciting, engaging, and competitive environment.

Founded in 2011, Team Neutrino is composed of about 30 high school students from around Story County, primarily in Ames and Gilbert. Students work alongside mentors to solve real-world problems and learn about the field of engineering. Students are responsible for building the robot, marketing the team, upholding a positive team image, maintaining effective methods of organization, documentation, delegation, designing a website, and fundraising. In addition members of Team Neutrino volunteer their time to the community through mentoring children through 7 summer camps, providing robot demonstrations, and facilitating and mentoring other FIRST programs in Ames.

Budget

To accomplish these goals, Team Neutrino has an annual budget of $57,000. If we reach our budget goal, we use the funds to cover the costs of registration ($9,000 for two regionals), travel ($15,500), and miscellaneous costs and preseason projects, such as practice and training robots, and outreach funds and supplies ($6,000). We hope to qualify for FRC Championships in Detroit, which would require us to raise even more money ($5000 for registration and $8500 for travel). We are currently working on expanding our sponsorship base among local companies and we're interested in gaining your support.

Sponsorship Levels

We recognize sponsors in the following ways based upon donation level. Donations at all levels are appreciated.

Diamond ($5000+) – Large logo on robot, banner, pit, t-shirt; mention on team displays and website
Platinum ($2500+) – Small logo on robot, banner, pit, t-shirt; mention on team displays and website
Gold ($1000+) – Logo on banner, pit, and t-shirt; mention on team displays and website

Please let us know if you have questions or would like to know anything else about our team or budget.

We appreciate your time and consideration in supporting our team! Please respond to:

Claudia Murphy
Co-Captain
890146mur@ames.k12.ia.us
(515) 357-8803

Matthew Hehr
Fundraising Manager
883363heh@ames.k12.ia.us
(515) 357-1324

Thank you! Signed,
Students of Team Neutrino

www.teamneutrino.org

A letterhead was designed and used on team documents. Above is a letter used to inform businesses about sponsoring Team Neutrino.

Tri Fold Brochure

What is FIRST ROBOTICS COMPETITION ?

FIRST®
For Inspiration and Recognition of Science and Technology.

The mission of FIRST is to inspire young people to be science and technology leaders, by engaging them in exciting mentor-based programs that build science, engineering and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership.

Founded by Dean Kamen in 1989, FIRST develops accessible, innovative programs to motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

For more info on *FIRST*
www.firstinspires.org

Team Neutrino 2019

For more information about our team visit our website at:

Team
Neutrino
FIRST Robotics Team #3928

www.teamneutrino.org

About Team Neutrino

Team Neutrino faces the exciting challenge of building a robot to compete in FIRST Robotics Competition events. The team is composed of high school students from Story County. Each year a new game is released in the first week of January. The students have six weeks to design, build, and program the robot. While working alongside mentors at their build space at Iowa State University, students solve problems and learn about the field of engineering. They are also responsible for marketing the team, creating a positive team image, designing a website, and fundraising. Team Neutrino students volunteer their time to community events such as team developed summer camps, robot demonstrations, and community service projects.

The robot above was designed to play INFINITE RECHARGE, this year's challenge. Robots can score through shooting balls into various goals, spinning a color wheel to the correct color, or climbing and balancing on a high metal bar with other robots.

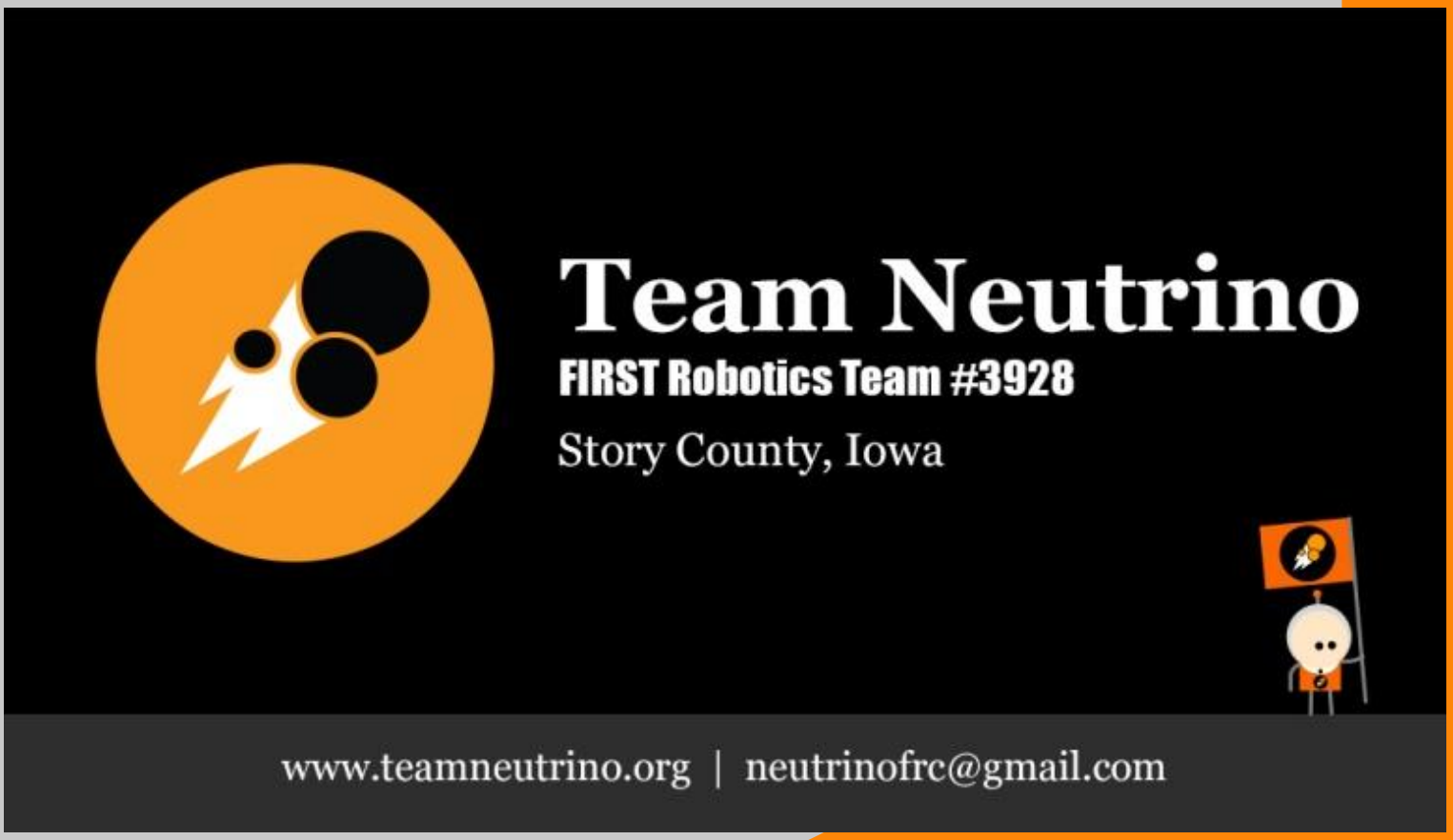
FRC is a unique varsity Sport for the Mind™ designed to help high schoolers discover how interesting and rewarding the lives of engineers and scientists can be. Students gain the technical skills, professionalism and self-confidence that all but guarantee them extraordinary career opportunities.

Team Neutrino works hard to inspire students to pursue STEM. The team mentors 16 FIRST teams, runs eight summer camps, and volunteers for over 2,000 hours each year. Team Neutrino is well known in the community as being a cohesive, spirited group of high schoolers committed to spreading the mission of FIRST.

This brochure was developed as a way to educate the community about our team, FIRST Robotics, and the Mission of FIRST.

Business Card

A business card was designed to direct people to the website to learn more about the team. The front has the logo, name, and number, and the back is plain white for use of writing on and other information if needed.



Team
Neutrino
FIRST Robotics Team #3928

FRONT

The front of the shirt remains the same from year to year, and the back is updated with the sponsors for each year.

BACK

Shirt Design

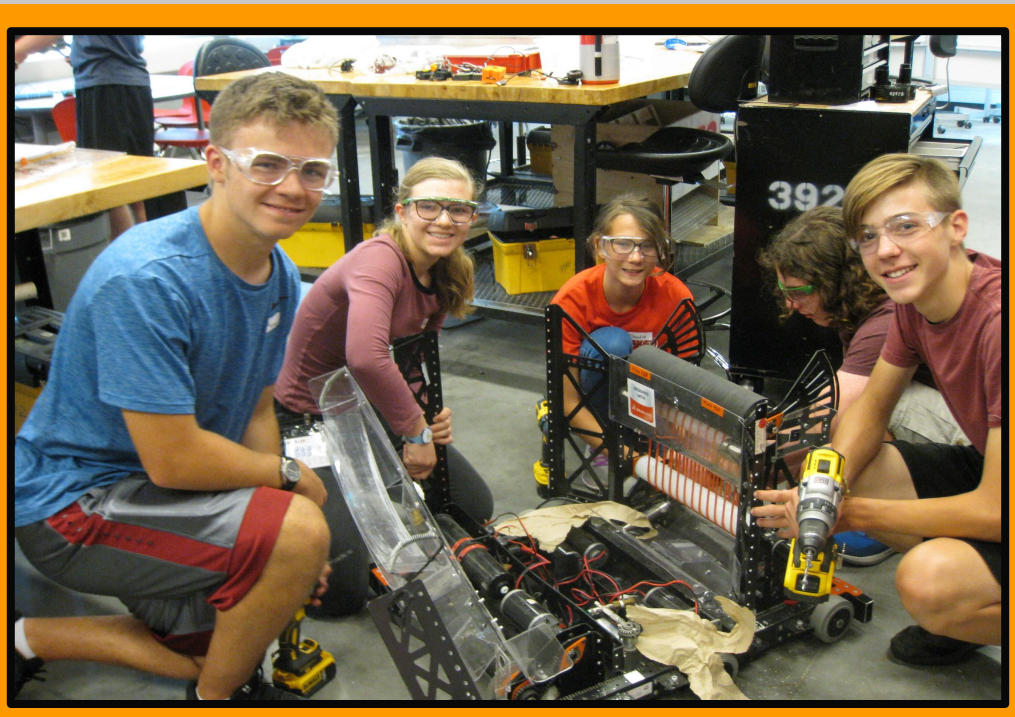
The Website

The website offers information about the team and has resources the team has developed through our outreach. Some of our resources include FLL Jr. lesson plans, FLL team ideas, robotics class resources, fundraising resources, and more!

Pre-Season

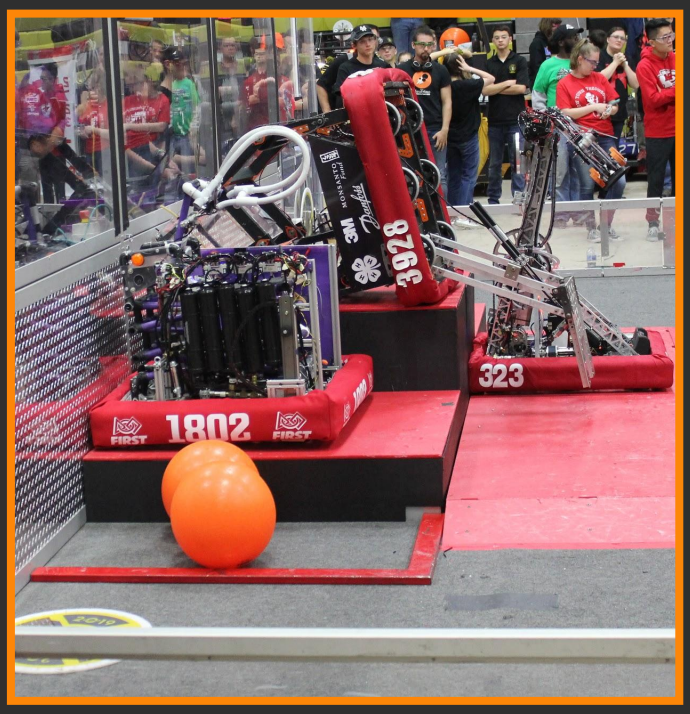
2020

Training Camps



Ten training camps are held over the summer, teaching topics such as CAD, mechanical, electrical, and graphics. They are used to teach members about all of the different subteam responsibilities and skills.

Cow Town ThrowDown



Team Neutrino attends the CowTown Throwdown offseason competition every year. It gives new members the chance to see how they want to contribute to the team lets them see what competitions are like. This year the team was fortunate enough to win first place in the competition.

Mock Kickoff

We held a mock kickoff as an opportunity for new members to get a feeling for what the actual kick off would be like. They watched one of the old game animations and came up with ideas and strategies for what they would want a robot for that game to do.

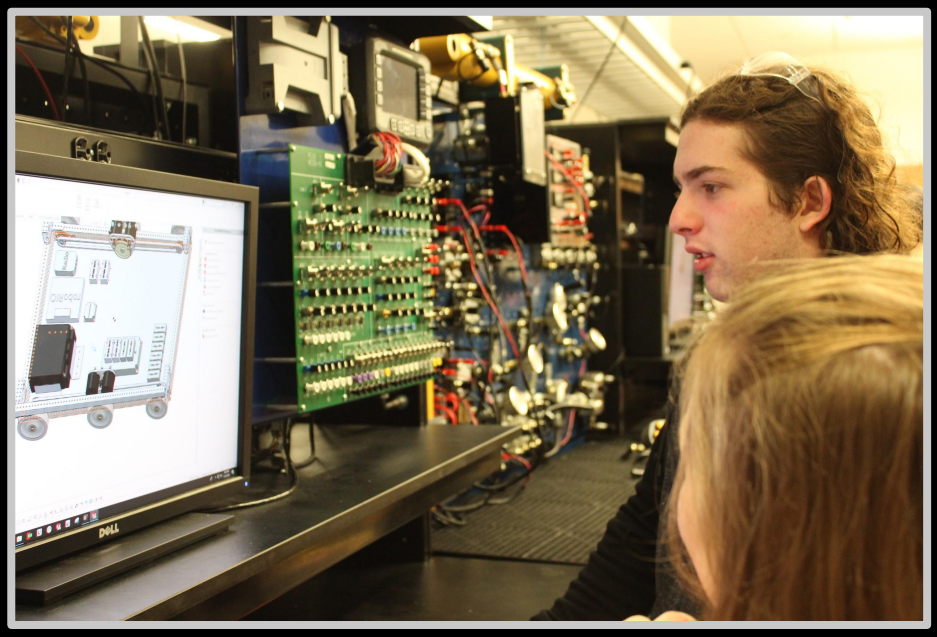
Build Season

2020

2020 Kickoff

INFINITE RECHARGE

Kickoff marks the start of the six-week build season. The team watched the live stream, read the game manual and began planning for this year's game, INFINITE RECHARGE. We mapped out the field and played the game to get an understanding of what it's like.

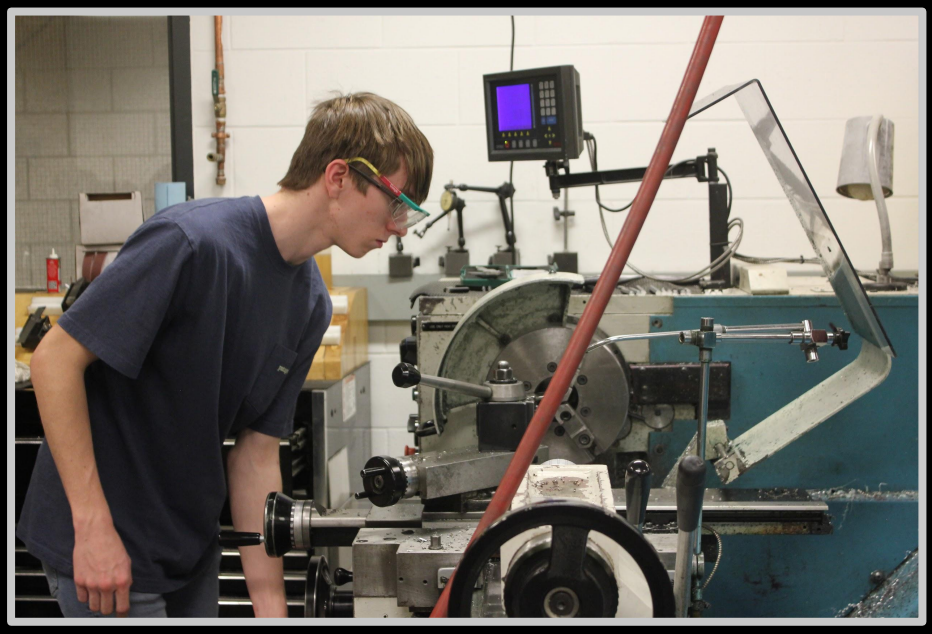


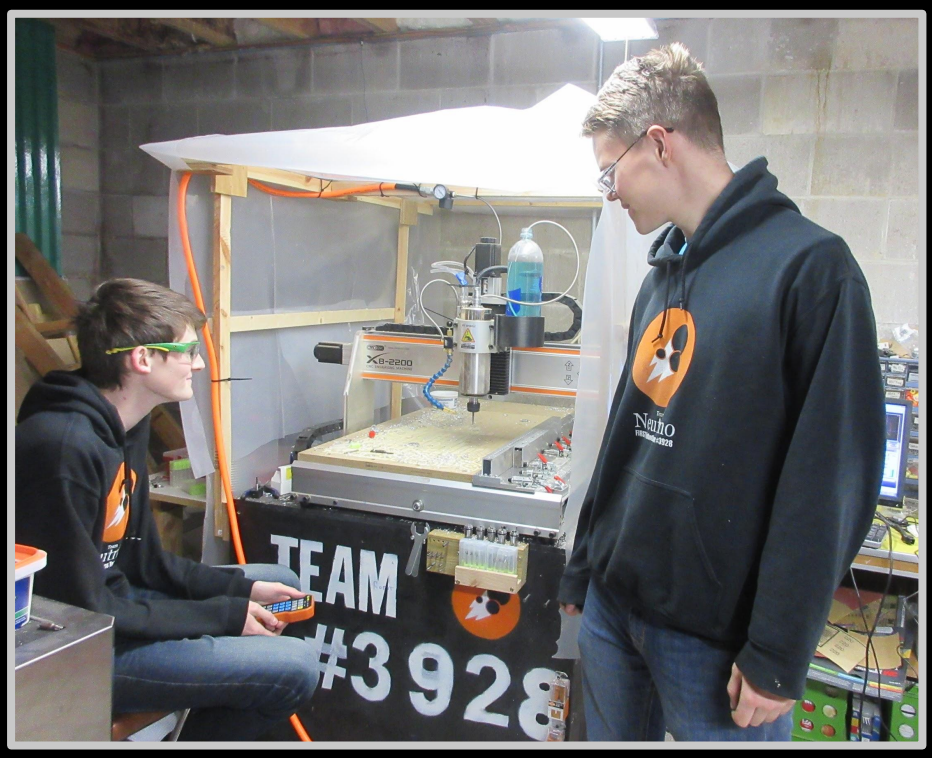
Students design the robot in Solidworks, a 3D computer modeling program

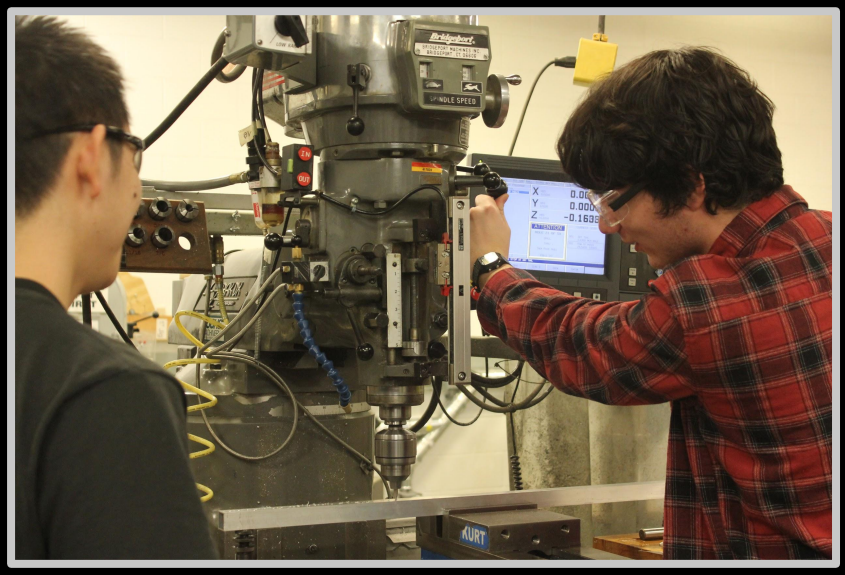
CAD

Ideas are tested and refined through prototyping before final production

Prototyping

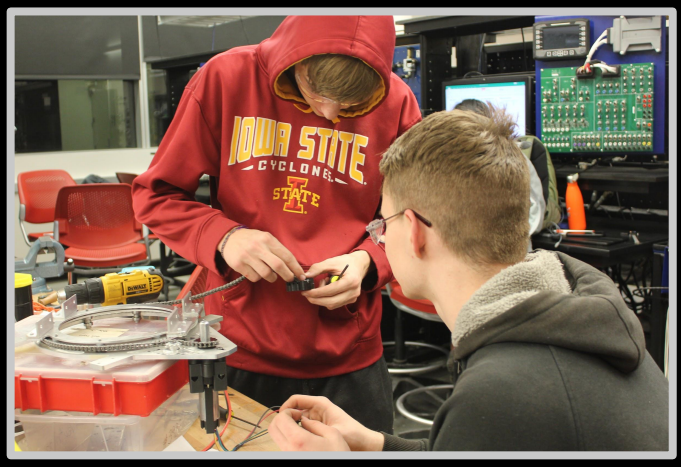


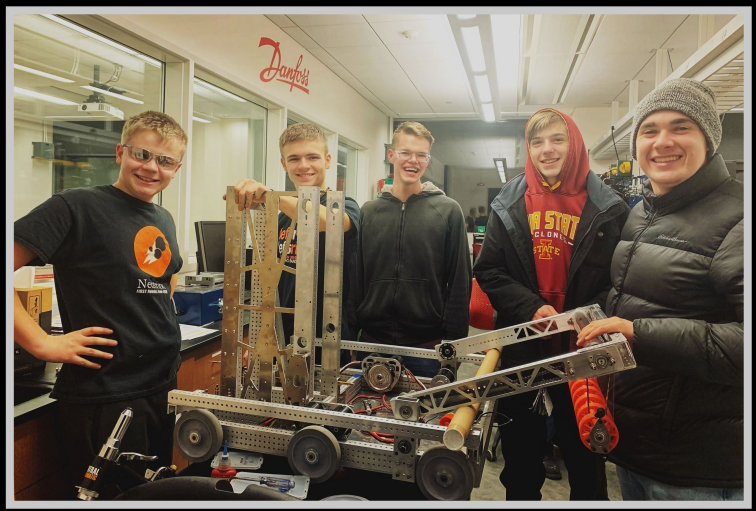




Students guided by mentors machine parts for the robot at Iowa State University's Boyd Lab and the team's CNC Router

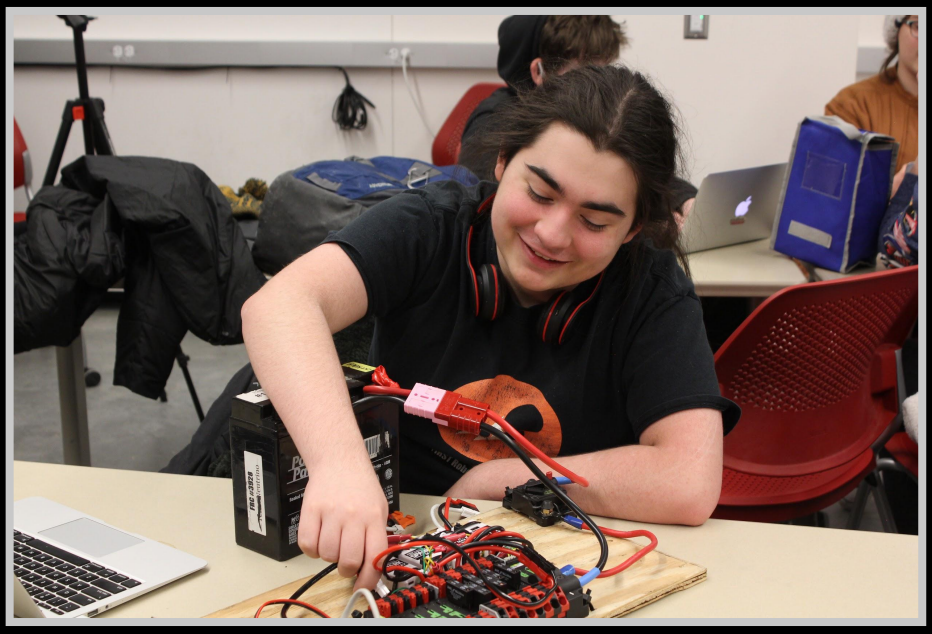
Manufacturing

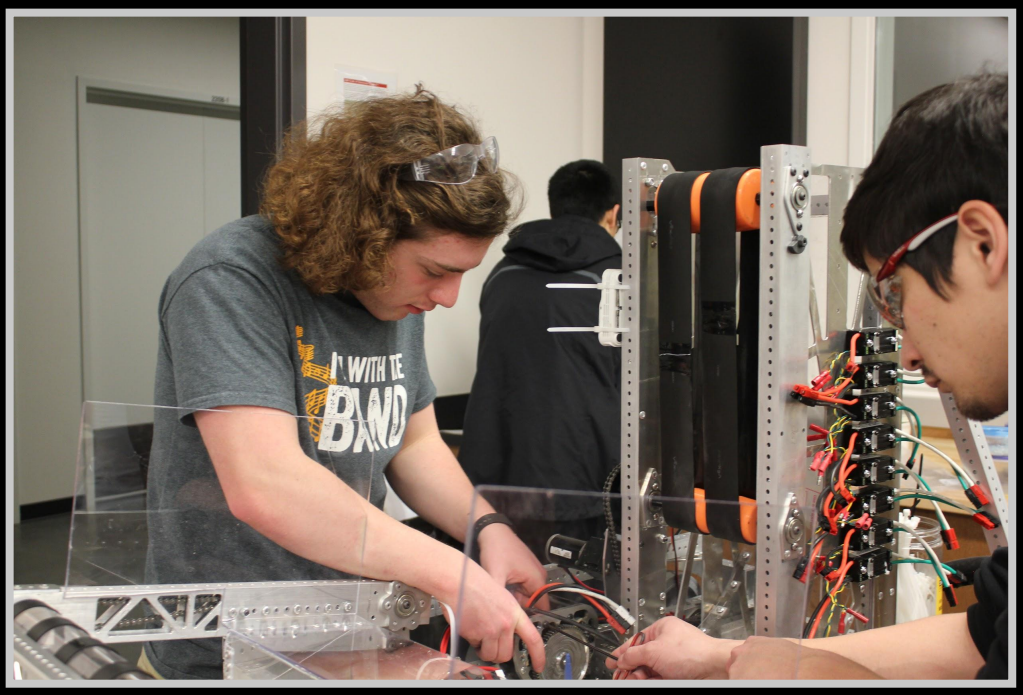


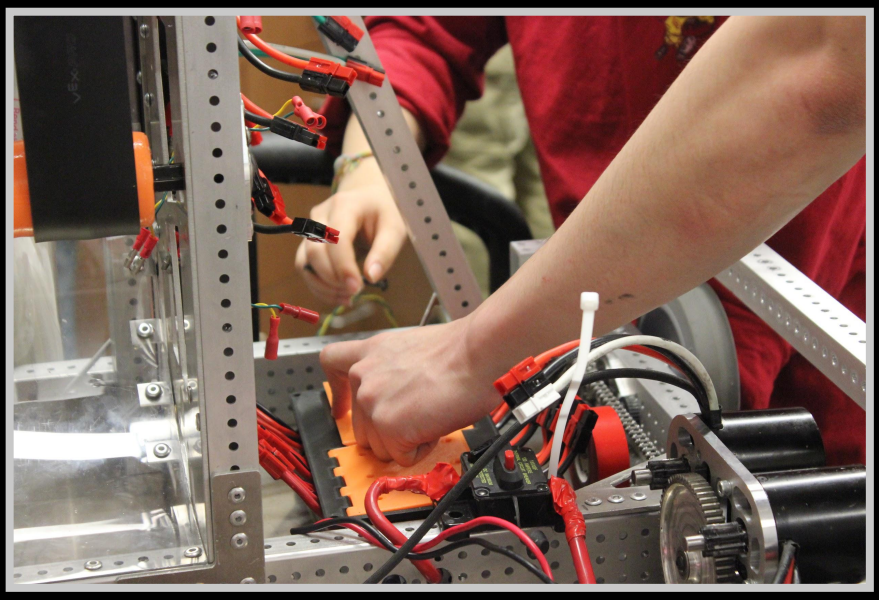


Robot comes together with student assembly and guidance from mentors

Assembly







Electronics, batteries, and wires are installed and tested by students and then the controls team programs the robot with java, as well as testing and refining visual controls.

Controls

Students spend time working on the Chairman's essay, executive summary, and presentation

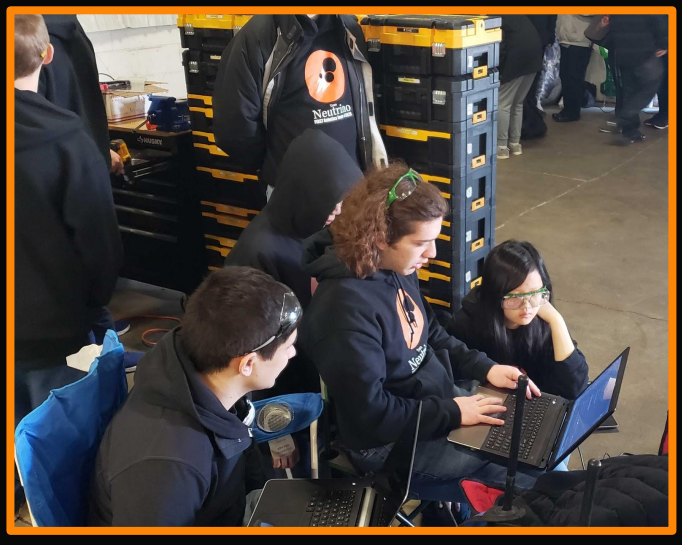
Chairman's

Graphics's team works on media related tasks such as newsletters and videos

Graphics

Corndog Classic Scrimmage

The Corndog Classic Scrimmage is an event for all Iowa teams to come and test their robot before competition on a full field.



Robot Reveal

Near the end of build season, we reveal our robot to the public. Families and community members get a chance to be up close and personal with our robot.

Newsletters

2020

Team Neutrino

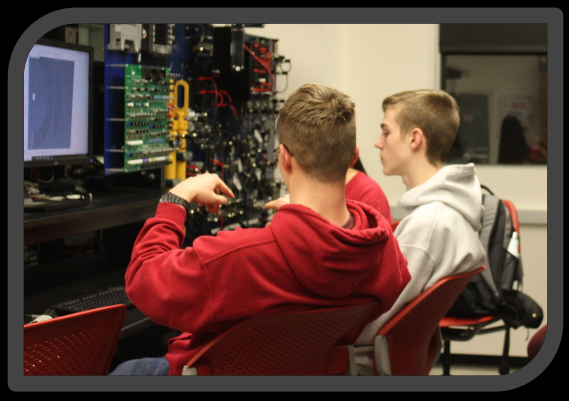
Week 1

Kickoff

Team Neutrino got together for the 2020 FRC season kickoff on January 4th. We watched the live stream and got introduced to Infinite Recharge. We spent the day planning and deciding our strategies for this season.

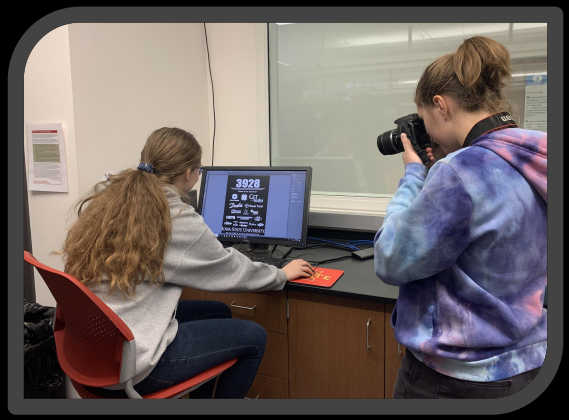
Design and Controls

Team Neutrino started working on prototyping our climber and three shooter ideas. Controls members have started writing programs for autonomous and individual mechanisms.



Chairman's

The Chairman's subteam has completed a rough draft of the essay as well as most of our interviews. We are also working on the executive summary and have selected this year's presenters.



Graphics

Graphics members completed the back designs for our 2020 shirts and ordered them. We uploaded new pictures from this season and made this newsletter.

FIRST

Iowa State University
College of Engineering

CIT Signature Transportation

John Deere

Bayer Fund

Danfoss

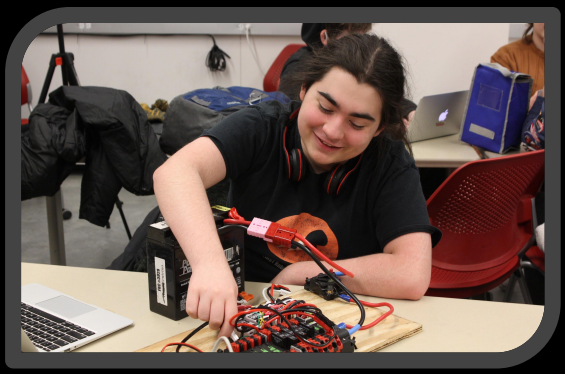
2020

INFINITE RECHARGE

Coming Next Time: We are starting to build our drivetrain with the CNC Router!

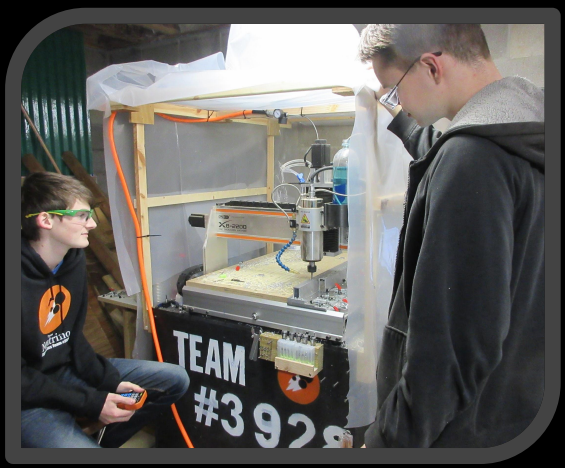
Team Neutrino

Week 2



Mentoring FLL Jr

This week we started mentoring three FLL Jr. teams at Meeker Elementary school. On Saturday, the three teams we mentored from St. Cecilia presented at the FLL Jr. Expo at ISU and answered questions from Team Neutrino design students.



Chairman's

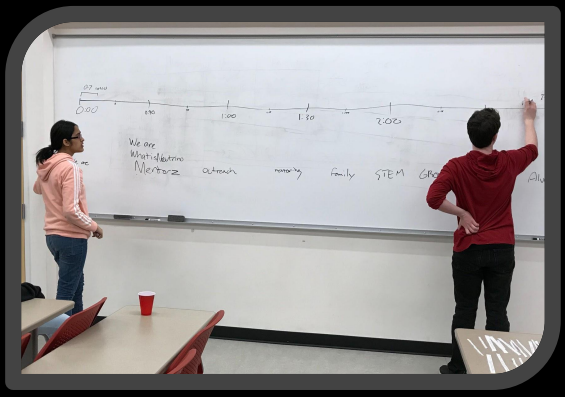
Chairman's team has finished storyboarding the Chairman's video! We met with Graphics subteam to discuss the general outline of the video and portions of interviews that we would like to include. We made it to the third draft of our essay!

Controls

The controls subteam finished programming the drivetrain and made a test board. Currently, we are working on laying out code for various subsystems and preparing to set up our autonomous modes.

Design

The design subteam made some key design decisions about robot size and mechanisms. Prototyping of the scoring mechanism showed promise in terms of range and accuracy. Design of drive base was finalized and components were fabricated with the CNC router.



Coming Next Time: We will be assembling the drivetrain gearboxes!

FIRST

Iowa State University
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2020

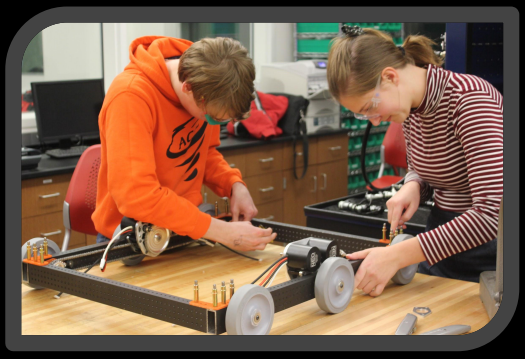
INFINITE RECHARGE

Team Neutrino

Week 3

Scouting

Scouting subteam prioritized a list of robot actions to record during matches. We have also been working on designing our own scouting app. Since the styling of the app is done, we have moved on to using Javascript to program the app.



Painting Competition Bot

Team Neutrino members are excited to continue the Neutrino tradition of spray painting different parts of the competition robot in orange and black!

Design

This week the design subteam finished the robot drive train and will soon begin manufacturing parts for other mechanisms.

FLL State Championship

Five teams mentored by Team Neutrino competed at the FLL State Championship. Congratulations to the Metro Huskies for winning the Project Innovative Solution Award!

If you would like to learn more about FLL, go to the FIRST website.

FIRST

Iowa State University
College of Engineering

CIT Signature Transportation

John Deere

Bayer Fund

Danfoss

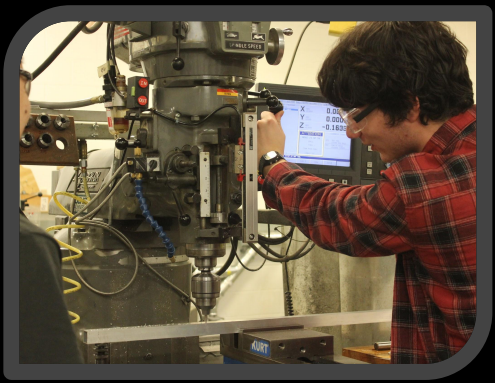
2020

INFINITE RECHARGE

Coming Next Time: The team will start manufacturing parts in Boyd Lab!

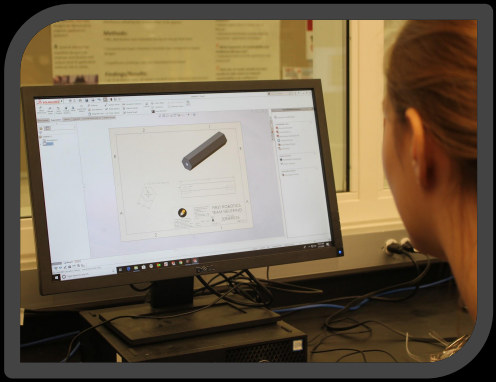
Team Neutrino

Week 4



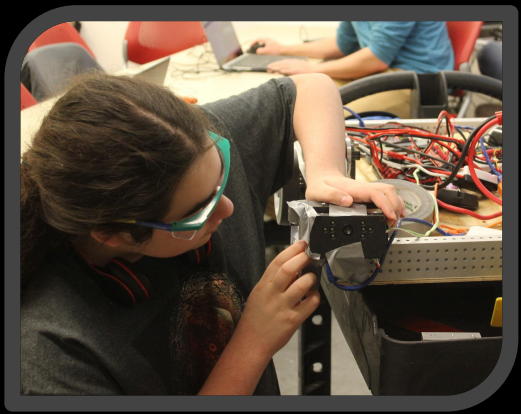
Manufacturing

Over the past week, manufacturing completed two drive bases, along with making intake and shooter elements. We made shafts on the lathe and milled aluminum tubing in Boyd Lab.



Design

This week, design has been busy finalizing the robot CAD and design. We overcame obstacles with integrating separate subsystems, which caused some delays. More students are currently learning how to make CAD drawings of parts.



Vision Tracking

Controls has been working on vision tracking. We are working on using Limelight to accurately track the hex-shaped target. This process involves manipulating an image and then using filtering to section off the part we want to track.

Starting FRC Team in Iraq

The outreach subteam is assisting Maab, a Neutrino student, and her father to form the first FRC team in Baghdad, Iraq. Our goal is to expose Iraqi kids to FIRST. We are still at the beginning steps but are excited to see the finished result.

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Coming Next Time: Submitting the Chairman's Award essay and executive summary!

Team Neutrino

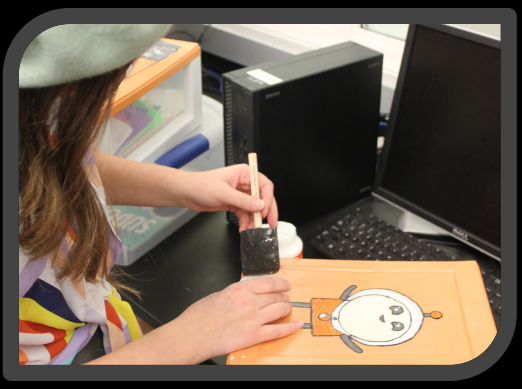
Week 5

Chairman's

Last week, the Chairman's team submitted the Chairman's essay and executive summary for judging! We started writing the presentation for competitions and worked out details for the prop we plan on building.

FLL in Haiti

Team Neutrino is helping a family from Haiti to start FLL at their neighborhood school. These students have very little experience with STEM activities. We are sharing lesson plans from our Mindstorms camps and hope someday to do training camps for them in Haiti.



Mental Health

We have recently started efforts to support mental health on Team Neutrino. We finished making "break boxes" to hold fidget tools and coloring supplies to help the team de-stress during the stressful time of build season.

Welding Belts

This year we are using flat urethane belts on our robot for the first time! We chose to make the belts ourselves to save money but then found it challenging to bond them. Team members experimented with super glue, heat, and an iron before creating a metal jig for welding belts.

Coming Next Time: Girls in Science Festival at the Science Center of Iowa!

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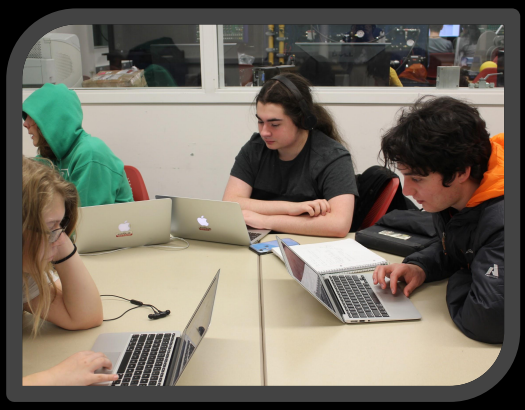
Team Neutrino

Week 6



Wiring the Robot

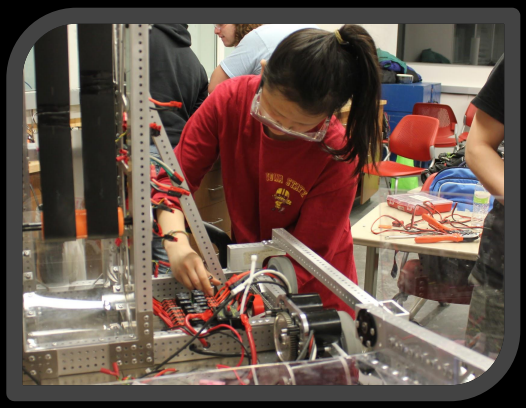
This past week we've accomplished a lot of the positioning and implementation of the electrical components on our robot. We finished wiring most of our motors to their respective motor controllers and to the PDP. We should be ready to begin running the robot soon!

Girls in Science Festival

On February 8th, five Neutrinos were able to visit the Science Center of Iowa for the Girls in Science Festival! We encouraged kids of all ages to experiment with Snap Circuits. We also assisted with other STEM workshops.

Scouting App

The scouts have been continuing to work on the app and have finished programming the display and buttons for the scouters to use during competition. They've started work on the QR code scanner and the data visualizer for the drive team.



Making Bumpers

This year new members were given the chance to make our robot bumpers. The bumpers were made out of pool noodles, duct tape, wood, fabric, and staples. We made them a different way this year to meet weight requirements.

Coming Next Time: We will be going to the Scrimmage and having our Robot Reveal!

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Outreach

2020

4th of July Parade

Team Neutrino participated in the city of Ames' 4th of July parade, tossing candy and demonstrating the previous year's robot.

Rocket Day

During Rocket Day we built bottle, straw, paper rockets as an anniversary for Apollo 11, we launched the rockets at 2:00 pm and 5:00 pm. we hosted this event at the Story County Fairgrounds.

Iowa State Fair

During the 2019 offseason, Team Neutrino got the opportunity to talk with many people about STEM and FRC at the Iowa State Fair. The team also demoed the robot at the event.

Edwards Elementary Science Night

Team Neutrino was invited to demo at the Edwards Science Night. There, we got to talk to many young kids and their parents about FIRST and how they and their children could get involved.We also set up a little booth for kids to experiment with makedo kits.

ISU Research Park Visit

Potential sponsors came to our demo, for the second year, at the ISU Research Park. The people who worked in the building were able to come down and learn about what we do and how they could get involved!

Month of Cardboard

For the Month of Cardboard the team went to the Ames Public Library we let people of all ages come in and make cardboard spaceships and cardboard astronauts.

Science Center of Iowa

3928 has been volunteering at the SCI for eight years. This year we volunteered at two separate SCI events: The Mini Maker Faire,and Girls in Science Festival.

Sponsor Visits

This year, we visited:

- CIT
- REG
- Interstate Batteries
- Danfoss
- John Deere
- ISU Agricultural and Biosystems Engineering Department

We got to demo our robot and present about our team!

Mentoring

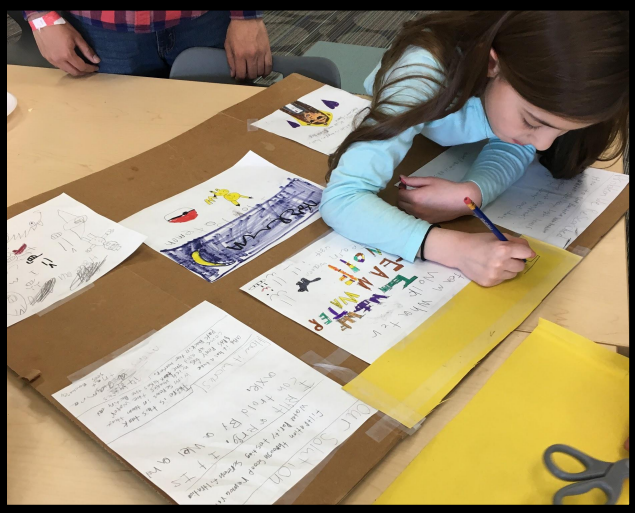
2020

In the 2019-2020 season, 3928 mentored 9 FLL Jr. teams

Fellows Elementary
(3 teams)

St. Cecelia Elementary
(3 teams)

Meeker Elementary
(3 teams)



FLL Jr.

E=mc^(hammer)
- State Advancing Award

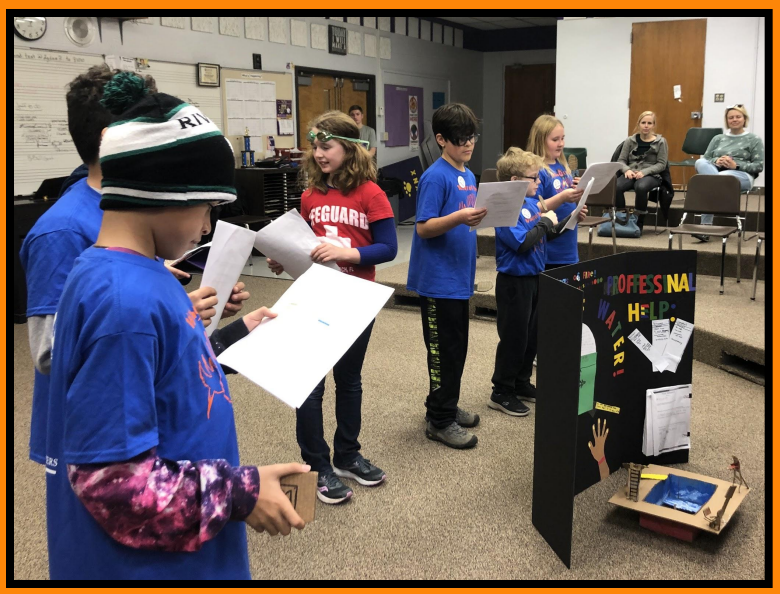
archiTECHS
- State Advancing Award

Terrific Turkeys

Metro Huskies
- State Advancing Award
- Robot Performance Honorable Mention
- Innovation Project Honorable Mention

PROGramming Pigeons
- Robot Design Award

Ames Middle School FLL



Meeker Elementary FLL
Shining Yeets
- Innovation Project Honorable Mention

Wings of Fire
- Innovation Project Award
- Global Innovation Award Nomination

Leglobe People

Fellows Elementary FLL
People

St. Cecilia FLL
Metro Llamas
- State Advancing Award

Meeker, Fellows, and St. Cecilia FLL

Team Neutrino hosts and organizes an FLL scrimmage every year since 2011 where teams from around Ames practice competing before regionals.

At the regional we have practice matches, project presentations, and robot interviews. We also do a robot demo of our robot from last year.

Ames FLL Scrimmage

At the Webster City regional, we mentored nine teams and assisted one, and had many of our team members volunteer.

We also showed our robot to interested passerby, and informed them about Team Neutrino, FRC, and FIRST as a whole.

Webster City FLL Regional

At the Iowa State FLL Championship Team Neutrino mentored 5 FLL teams and volunteered for the event.

Iowa FLL State Championship

Team Neutrino taught two annual Empower Enrich Excel classes this summer. We have taught the LEGO Mindstorms class since 2012.

In this class, we teach kids of grades 4-8 to program robots to navigate through tape mazes and to follow black lines.

This program introduces the kids to *FIRST* and the FLL program. Our goal with this camp is to get more kids involved in STEM and *FIRST*.

Empower Enrich Excel: LEGO Mindstorms

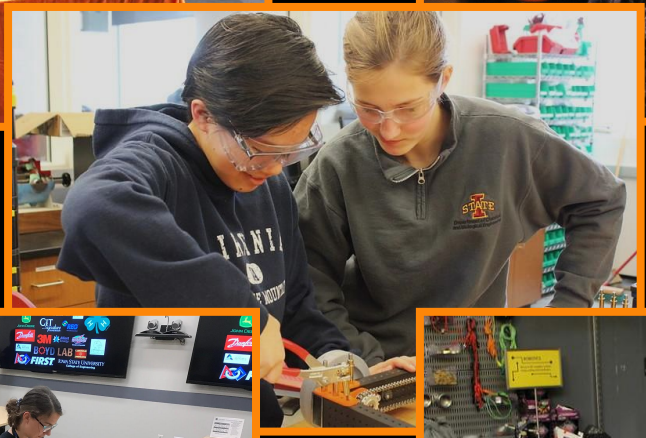
With a focus on learning by doing, students explored and made paper circuits, 3D printed objects, stomp rockets, and much more.

Created specifically for 1st-3rd graders, Mini Makers engaged students in several small projects related to the STEM fields.

This class is all hands-on and lets kids experiment and use their creativity. The students also put together a showcase in the classroom on the last day of camp.

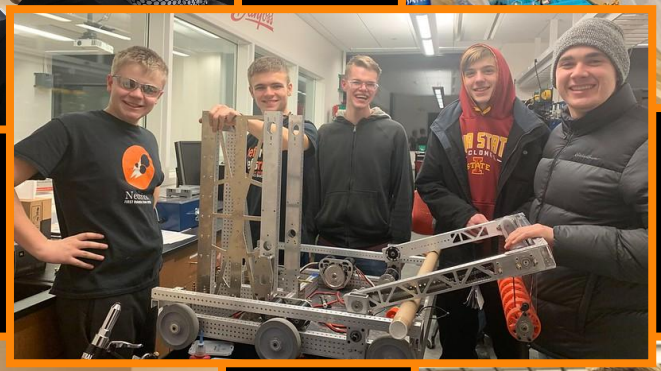
Empower Enrich Excel: Mini Makers

Award Submissions 2020



SHARE

INSPIRE



CREATE

DESIGN

FIRST Robotics Team #3928
2020 Season