# OPERATION P.E.A.C.C.E. ROBOTICS

## 4-H FIRST ROBOTICS TEAM 3461

# IMPACT BINDER

2024

# WHO WE ARE

Operation P.E.A.C.C.E. (Practicing Engineering and Competitive Cooperative Excellence) Robotics was established in 2010 to excite students to pursue STEAM through competitive robotics in Bristol, CT. Our team is a community team, meaning that we are not tied with any school system, being financially independent with the help of 4-H. Furthermore, we accept anyone regardless of background and skill level to join our team so they can learn the nessecary skills to become the next generation of innovators.

Every year, we strive to compete at the highest level as our students gain more experience in STEAM to outperform previous year achievements. Today, the team is a strong player in the FIRST community, competing not only at the New England District Championships, but also the World Championships in Houston, TX.

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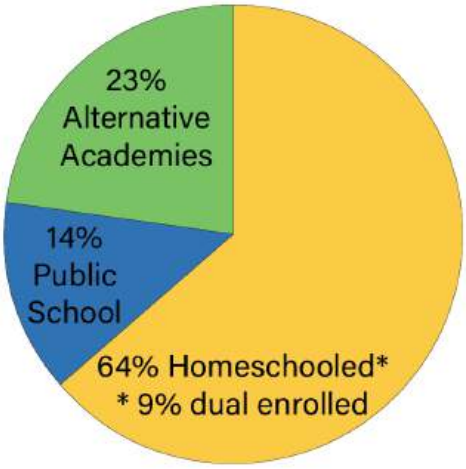
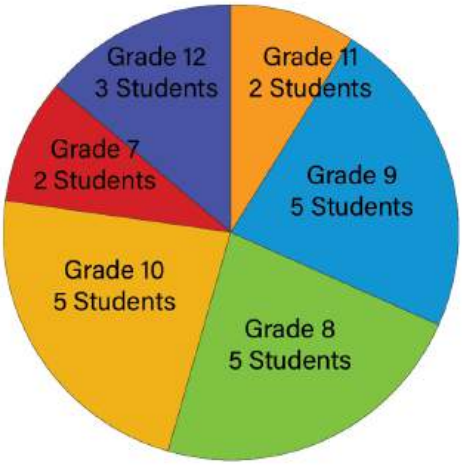
# OUR STATISTICS



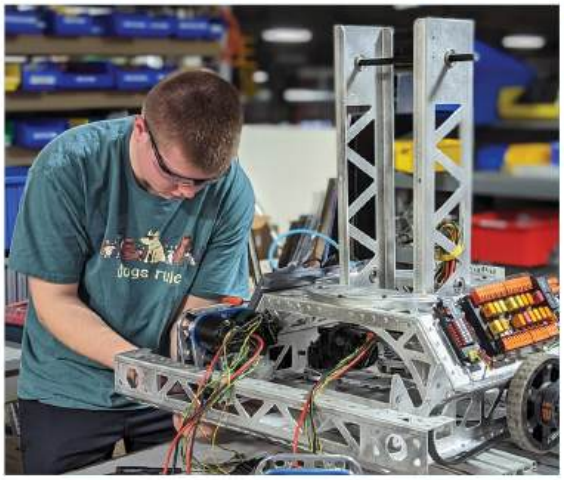

## OVERVIEW

In Connecticut, there are a lack of ways for students outside of public schools to participate in competitive robotics. Therefore, our founding mission was to create a place accessible for diverse students to grow in their skills. This section serves as an overview of our data, showcasing the progress and achievements of our members.

By tracking and reporting our statistics, we not only assess the effectiveness of our initiatives but also identify areas for improvement, ensuring an inclusive environment where all students, regardless of their educational backgrounds, can thrive and excel.

**22**
STUDENTS

**120%**
INCREASE



## OUR IMPACT
### WITHIN THE LAST 3 YEARS

**CURRENT STUDENTS**

- 100% of current seniors will pursue STEAM

**OUR ALUMNI**

- 100% of alumni study in STEAM fields
- Attended schools like WPI, TXCC, CCSU

## 13 TOWNS

Avon, Bethlehem, Bristol, Burlington, Cheshire, Farmington, Meriden, Middlebury, New Hartford, New Haven, Plainville, Southington, Wolcott

## # SCHOOLS

- Imago Dei Classical Academy (New Britian)
- Bristol Arts and Innovation Magnet School (Bristol)
- Lewis S. Mills High School (Burlington)

# MISSION & VISION

## OUR MISSION

*"Our mission at Operation P.E.A.C.C.E. Robotics #3461 is to teach students to explore and appreciate STEAM, encourage students to realize their capabilities, and to inspire others to learn and improve skills."*

### *HOW WE ACHIEVE OUR MISSION*

- How to apply engineering principles via the designing and construction of the robot
- Gained fluency in industry standard engineering software (Labview, SolidWorks, Java, etc.)
- Created a network with many engineering companies

## OUR VISION

*"Our vision is to provide a learning opportunity for <u>everyone</u> to become STEAM leaders, regardless of circumstance."*

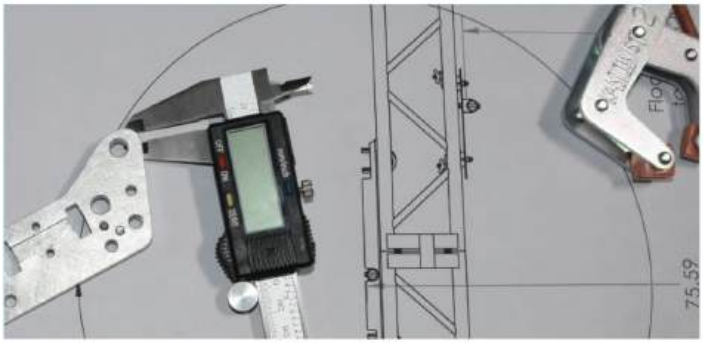
### *HOW WE ACHIEVE OUR VISION*

- Reach out to students from diverse backgrounds
- Create opportunity for people of all ages
- Promote accessible & sustainable STEAM in our state & the world

# ACHIEVEMENTS

## 2011

- Our First Year!
- Highest Rookie Seed at Northeast Utilities FIRST Connecticut District Event



## 2014

- Team Spirit Award at Southington District Event
- Quality Award at Pine Tree District Event

## 2016

- District Event Winner at Hartford District Event & UMass Event
- Dean's List Finalist Award at New England District Championship

## 2017

- District Engineering Inspiration at NE SE Mass Event
- District Event Finalist

## 2018

- District Engineering Inspiration at NE Rhode Island Event
- First Time at the World Championships!

## 2019

- District Event Finalist at Western New England Event

## 2022

- Entrepenurship Award at Waterbury District Event
- 3rd Seed Captain at New England District Championship
- 5th Seed Captain at World Championships -- Newton Division
- Quality Award at World Championships

## 2023

- Excellence in Engineering Award at NE Waterbury Event
- Innovation in Control at NE Greater Boston Event

**14 AWARDS**

# PARTNERS & SPONSORS

The Arthur G. Russell Co., Inc. (AGR) is a world leader in custom assembly machinery, with a focus in the medical device and diagnostics industry. They provide us our build space, access to their shop tools and machines, and contributes financial aid. We have a close working relationship with the engineers and machinists, providing guidance and advice on our designs

Our team has sustained a relationship with 4-H since our inception. They help us maintain independence from any schools, thus giving us the unique ability to recruit students from any high school that doesn't have a FIRST team as well as homeschoolers, who otherwise wouldn't be able to access FIRST's programs.

THE BAILY FAMILY

FRIENDS & FAMILY OF P.E.A.C.C.E.

PRICE CHOPPER

LITTLE SHOP OF ODIE

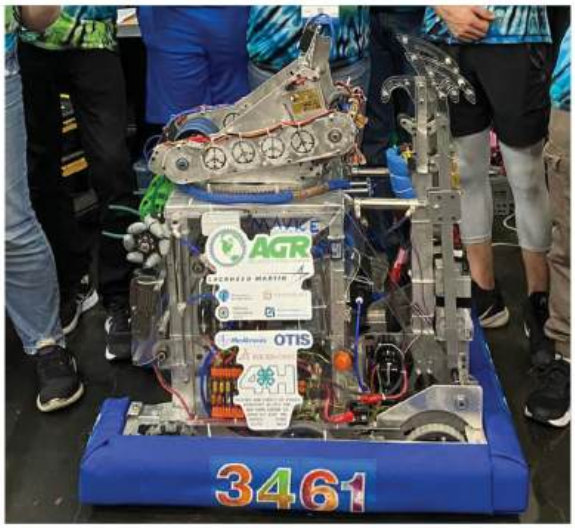
THE HOFFMAN FAMILY

# MEET THE ROBOTS

## WE HAVEN'T FIGURED IT OUT YET - 2022

For the 2022 Game "Rapid React", our team presents "We Haven't Figured It Out Yet". This robot collected, aimed, and shot cargo into the hubs in the center of the field. At the end of the game, the robot used it's hooks to climb rungs of the hangar.

This robot was ranked 5th at the Houston World Championships (Newton) and won the quality award.



## HAGILE - 2020 - 2021

For the 2020-2021 game "Infinite Recharge", our team presents "Hagile". Hagile collected, aimed, and shot power cells into the higher goal of the field, and was small enough to maneuver under the control panel in the middle of the field.

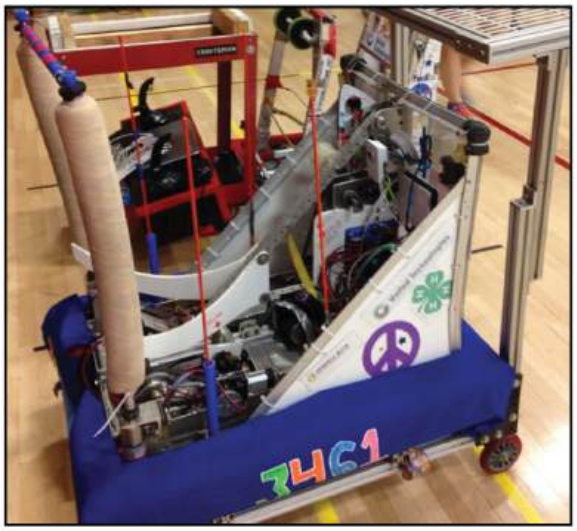
This robot did not partake in any official competitions due to the COVID-19 Pandemic

## CHUCK - 2014

For the 2014 game "Aerial Assist", out team presents "Chuck". Chuck is a small robot who could pick up large yoga balls, and throw them using the catapult in the middle of the robot.

Chuck won the Quality Award at the Pine Tree event.

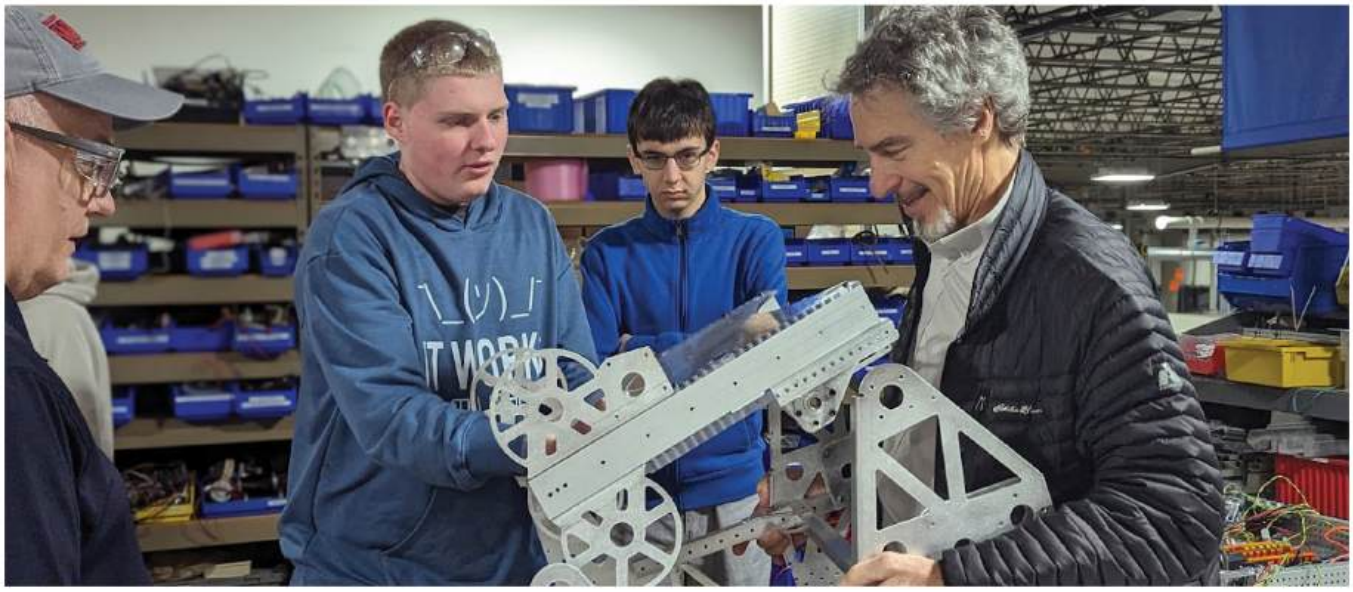
In 2022, Chuck received up-keeping and was put into working condition again, now being demonstrated consistently at fairs starting in 2022.



# OUR MISSION GEAR

# OUR MISSION

*"Our mission at Operation P.E.A.C.C.E. Robotics #3461 is to teach students to explore and appreciate STEAM, encourage students to realize their capabilities, and to inspire others to learn and improve skills."*



## OUR GEAR

To achieve our goal, we've organized our efforts into six distinct categories, each representing a crucial facet of our team's functions. Each section is a piece within our "gear", where each section has different resources and strategies in order to effectievly achieve our goals.

The mission gear section plays a pivotal role in ensuring that our team is well-equipped to make a lasting impact on the world when they graduate from the team.

## GEAR OVERVIEW

- **RED:** Spark Innovation
- **ORANGE:** Build a Robot
- **YELLOW:** Create STEAM Leaders
- **GREEN:** Build Skills
- **BLUE:** Increase ED&I
- **PURPLE:** Impact Our Community

## OVERVIEW

Our "Spark Innovation" section leads our vision for a future where curiosity ignites innovation, and every student becomes a catalyst for positive change. Grounded in a commitment to STEAM (Science, Technology, Engineering, Arts, and Mathematics) education, this part of our mission guides us toward how we allow anyone to become innovators of tommorow. We aim to break barriers and inspire creativity in all.

Through engaging projects, collaborative problem-solving, and hands-on experiences, we envision students discovering their potential as innovators. We empower every participant to envision, create, and implement solutions to real-world challenges through both the FIRST Robotics Competition, and through activities to enrich their abilities.

## OUR GOALS

1 **CREATE OPPORTUNITY**

Allow anyone to access and enrich from STEAM

2 **PROVIDE EXPERIENCES**

Create various areas to build upon skills

3 **APPLY SKILLS**

Provide chances to apply industry-standard skills

4 **BECOME INNOVATORS**

Empower students to become STEAM leaders

## OUR OUTREACH

- Operation Innovation
  - Current Activities:
    - Free Java Classes
    - Free Design & CAD Classes
  - Future Activities:
    - XRP Kits @ Bristol Library
    - "STEAM on the Road" Bristlebots
- Collaborations with local STEM and Education Organizations
  - Future Plans:
    - Bristol Carousel Museum
    - Bristol Clock Museum
    - Bristol Chamber of Commerce
    - CT Science Center
    - Local Schools
    - NutmegTV

# BUILD A ROBOT

Every year, 3461 is tasked with building a robot to a game never before seen from FIRST.

When building our annual robot, we task ourselves to create a robot more competitive than the last, while utilizing new technologies to improve our skills. As we navigate the challenges of 'Crescendo,' we approach our build season with the same mindset: **engineering is an ongoing and iterative process**. Even when we have developed solutions, there are ways to optimize them further.. Because of this mindset, we can narrow down design choices on the robot, and open the option for new designs to be created. This year, we took on the challenge of creating a compact robot that can still fufill the game objectives.

## OUR GOALS

1. **USE INDUSTRY TECH**
   Utilize industry tech to create unique learning
2. **BE COMPETITIVE**
   Create a robot to perform well at competition
3. **CREATE DOCUMENTATION**
   Pass learning down by creating documentation

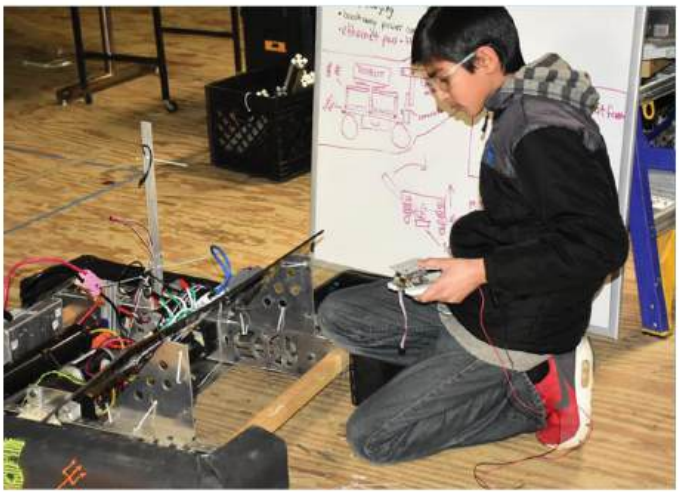
## OUR 2024 ROBOT "C#"

On January 8th, Operation P. E.A.C.C.E. Robotics gathered to watch the reveal of the 2024 Game: *CRESCENDO*. First, we read everything in the manual including the rules, allowing our students to brainstorm possible designs. Second, we looked to meet a day after the reveal to decide on what we should focus on at a team. We use this time for every student to provide drawings of their ideas, and explain what they feel we should focus on. After this, we vote on our priority list, and we begin work. At this point, each subteam meets to discuss their own to-do list for the season, and how to collaborate with other subteams.
By the end of Week 4, the team started fully CAD-ing designs and started assembly.

When creating C#, we kept our main objectives in mind: shooting notes consistently and accurately. To accomplish this purpose, C#comes with an adjustable pivot on the shooter, and a limelight for vision to recognize AprilTags. In addition, we wanted to prioritize ONSTAGE points, therefore our robot is fitted with a climber on the drive frame base to quickly score. Our robot is fitted for middle-stage climbing, to allow us to utilize the diverter for TRAP points.

## CREATE STEAM LEADERS

One of our main goals is to empower students to become leaders in their field through hands-on learning, innovation, creativity, and specialize in community outreach. We've also allowed students to become disciplined in multiple fields (public relations, electrical, etc) to appreciate interdisciplinary collaboration, where professionals from different backgrounds work together on complex projects.



By the time a member graduates from the team, they've gained skills that make them stand-out in their field to change the future through robotics. Below is a sample of our impact on students & alumni from the last three yars.

## OUR IMPACT

### OUR STUDENTS

**STATISTICS**

- 100% of 2024 seniors will pursue STEAM
- 100% of 2020-2023 seniors will pursue STEAM fields & pursue secondary education
- Students have reported they are 5 times more likely to pursue STEAM as a career

### OUR ALUMNI

**STATISTICS**

- 100% of alumni have studied in STEAM fields
- Alumni work in their respective fields at companies like RBC Bearings!
- <80% of our mentor body are alumni!

## COLLEGES ALUMNI HAVE ATTENDED

ITHACA COLLEGE

CENTRAL CONNECTICUT STATE UNIVERSITY

WPI

Tunxis Community College
Education That Works For a Lifetime

ASU

NEW HAVEN CHARGERS

NCCC

# BUILD HARD & SOFT SKILLS

Our team fosters the development of both hard and soft skills crucial for success in STEM fields. By participating in hands-on experience in designing, building, and programming our robot, our team, students not only gain proficiency in STEM disciplines but also develop the interpersonal skills necessary for effective collaboration and innovation in any professional setting.

## OUR GOALS

1

### HANDS-ON EXPERIENCES

Gain experiences with tech, software, and more.

2

### LEARN FROM EXPERTS

Learn from experienced alumni and mentors

# SKILLS

## HARD SKILLS

- Experience in CAM/CAD Software
  - Solidworks
  - Onshape
- Industry Documentation Skills
- Experience with Industry-Standard Technology
  - Gene Haas Vf4
  - Drill Presses
  - CNC machines
  - Bridgeports

## SOFT SKILLS

- Public Relations
- Communication Skills
- Experience with multiple disciplines
- Grant-Writing
- Presentation Skills
- Documentation
- Scribing
- Management
- Scheduling

# IMPACTING OUR COMMUNITY & STUDENTS

Creating opportunities for students from diverse backgrounds, including those who are homeschooled, is fundamental to the ethos of FIRST and our team. By embracing inclusivity, we not only enrich the fabric of our community but also unlock the potential of individuals who might otherwise face barriers to participation in STEM education. Through our outreach efforts and community engagement, we strive to democratize access to resources and mentorship, empowering all students to pursue their interests and passions in robotics and technology. By fostering a culture of inclusivity and providing opportunities for students from varied backgrounds to engage in STEM activities, we contribute to a more equitable and vibrant society while nurturing the next generation of innovators and problem solvers.

When we founded, we wanted to address a core issue in our area: 22,000 students in CT lack ways to become involved in robotics from not being enrolled in public education systems. As our team grew, we prioritized engaging underrepresented populations to encourage participation in FIRST, such as those experiencing financial difficulties. In addition to reaching to new communities, we always aspire to empower every voice on our team. With mentorship programs and hands-on experiences with professionals in their field, students are given every chance to succeed.

We are always looking for new and innovative ways to further this mission.

## OUR GOALS

**1 INSPIRE EVERYONE**

Allow anyone to join without boundaries

**2 SPREAD *FIRST*'S MESSAGE**

Push FIRST to teach about STEM careers

**3 REACH OUT TO PUBLIC**

Participate in events to help & inspire community

## OUR PLANS

- Participate in events to boost engagement and participation
  - CT Homeschooling Network
  - NutmegTV
- Create opportunity everywhere
  - FLL & FTC Support
  - Volunteer @ FIRST events

# COMMUNITY OUTREACH

# WE ARE COMMUNITY

To our team, the first step to spreading our mission and giving back is to get involved with our community. We do this by attending various outreach events, fundraisers, activities, and even speaking on TV show to get the word out! By getting the word out, this allows members of our community to become involved with us. We look for outreach events that are in our local area, have people of all ages, and adequate space for us to demonstrate our robot.

## WHY DO WE DO OUTREACH?

At the start of our team's inception, many of our goals could not be achieved without the unwaivering support of our community. Thirteen years later, central Connecticut regards us as one of the staples of their towns. Many people who have seen our demonstrations at local fairs, participated in our LEGO league teams, and more are now students on our team, sponsors of our mission, and our biggest supporters throughout the years. Our outreach is the embodiment of this, and we wish to give back in the same way they accepted us in 2011. We also look to spread our mission: creating accessible STEAM for everyone regardless of their background.

## PLANNED OUTREACH FOR 2024-2026

- A Minimum of Two Live Streamed District Competitions
- The Live Streamed New England Championship upon Qualification.
- The Televised World Championship in Houston upon Qualification.
- At least 6 fairs/community events such as the Harwinton Fair, the Wolcott Fair, the Terryville Fair, the Hartford County 4-H fair, and the Bristol Mum Festival.
- Several Off Season Events Including "Bash At The Beach", "Summer Heat", "Where Is Wolcott Invitational" and WPI's " Battlecry".
- Various Service Projects Including demonstrations at libraries
- Collaborations with local FIRST teams
- Various fundraising events, pie sales, restaurant partnerships, and Shake-The-Can.
- Low cost open-to-the-public workshop classes involving programming and manufacturing
- Mentoring local FLL teams
- Explore partnerships with local manufacturing companies to expand our knowledge

# OUR FAIR SEASON

Operation PEACCE Robotics has consistently attended fairs since our inception in 2010, starting with the Harwinton Fair. Our main goal at the fairs is to interact with our community, promote FIRST on a scalable level, and show off our robot! At this event, we also sell an assortment of PEACCE taffy to help fundraise for the next year's season.

## SEEING ROBOTS

We run a booth every day where we demonstrate the our robots, and even encourage children to interact with it as well. One year, this could mean driving the robot around the fair grounds, while the next could be catching balls that the robot throws.

In 2022, we re-demonstrated our 2014 robot, "Chuck." Chuck is fitted to hold and launch the 2014 yoga balls, all while decorated with our signature tie-dye look.

When the robot is charging, we allow everyone to get hands-on and see our engineering prowess up close.

## OUR FAIRS

- Harwinton Fair
  Attendance: 2010-2023
  Impact: 13,000 People
- 4-H Fair
  Attendance: 2017-2021
  Impact: 4,000 People
- Bristol Mum Festival
  Attendance: 2012-2023
  Attendance: 100,000 People
- Terryville Fair
  Attendance: 2021
  Impact: 700

## WHY FAIRS?

Fairs have allowed Operation PEACCE to interact directly with our community, and inspire them with the message of FIRST. Many young students become so inspired by our presence, that they later on start their own teams, and join ours when they're old enough. We're regarded as a consistent and inspiring precense at our events.

We also work as a representatitve of FIRST, promoting resources to start FIRST Lego League and FIRST Tech Challenge teams within our area.

# AN IN-DEPTH LOOK

## Harwinton Fair

**Background:** Harwinton Fair, originally known as Harwinton Cattle Show and Fair, is a yearly event held by the Harwinton Agricultural Society. The first written record of the fair, according to members, is in the Secretary's Record Book dated 1853. We've attended the Harwinton Fair since 2011, and had the honor of attending during the 165th anniversary in 2022. At the event, we have a designated booth with a custom Operation P.E.A.C.C.E. sign displayed on top.

- **Years Attended:** 2011-2023
- **Impact:** 13,000 People

## 4-H Fair

**Background:** Every year, 4-H hosts a fair to showcase the amazing talent within young people involved in their program, offered through the UConn Extension system. Activities at fairs range from children's activities, entertainment, livestock and agriculture competition, and much more. Prior to 2023, we have been part of Litchfield County 4-H and participated in their fairs yearly. In Litchfield County, there are more than 25 clubs. The Litchfield County 4-H Fair hosts a two-day fair, which has been held since the 1930s, has been a staple in encouraging those of all different backgrounds to witness our STEM club.

In 2024, we will continue this long tradition by participating in the Hartford County 4-H Fair!

- **Years Attended:** 2017-2021
- **Impact:** 5,000 People

## Bristol Mum Festival

**Background:** The Bristol Mum Festival is an annual festival held in Bristol, CT. The festival celebrates chrysanthemums, formerly a major product of the town, and was first held on Sunday, October 7, 1962. Today, the festival brings together people of all ages from across the state, which reflects the true community interest of the city of Bristol. Activities at this festival include the Mum Parade, the Miss Mum Pageant, Art & Jazz Gala, car shows, horse and hay rides, and many more.
For the last ten years, the team was honored to take part in the Bristol Mum Festival by demonstrating the robot, representing the importance of manufacturing within the town's history. Next to the Soldier's Monument on Memorial Boulevard, we showcased our robot by playing a game of catch with whoever stopped by.

- **Years Attended:** 2012-2023
- **Impact:** 100,000 People

## Terryville Fair

**Background:** The Terryville Lions County Fair is an annual fair hosted in central CT every August. According to Terryville Lions Club President Martin Sandshaw, "The Lions Club began in 1917 with Melvin Jones' vision of community service and has grown to encompass over 1 million members worldwide." Many activities take place such as demolition derby, skillet throwing, motor cross, and general fanfare for the public to participate in.

**Years Attended:** 2021

- **Impact:** 1,000 People

Salt Water Taffy
Sale
OPERATION P.E.A.C.C.E. ROBOTICS
4-H
FIRST

Operation
P.E.A.C.C.E.
4-H Robotics
We Need
Your Support

Aliens
$8
WINS

Operation
P.E.A.C.C.E.
4-H Robotics
We ♥ Questions
About Robotics
Need
Support
KIDDIE

OPERATION PEACCE
ROBOTICS
CANDY
FACTORY

AGR
4-H

Farm Products & Canning


EXHIBITION CENTER

Alien
-5$
RING
WINS
STRIKER
WINNER EVERY TIME

We ♥ Christian About Robotics
Operation PEACCE
4-H Robotics

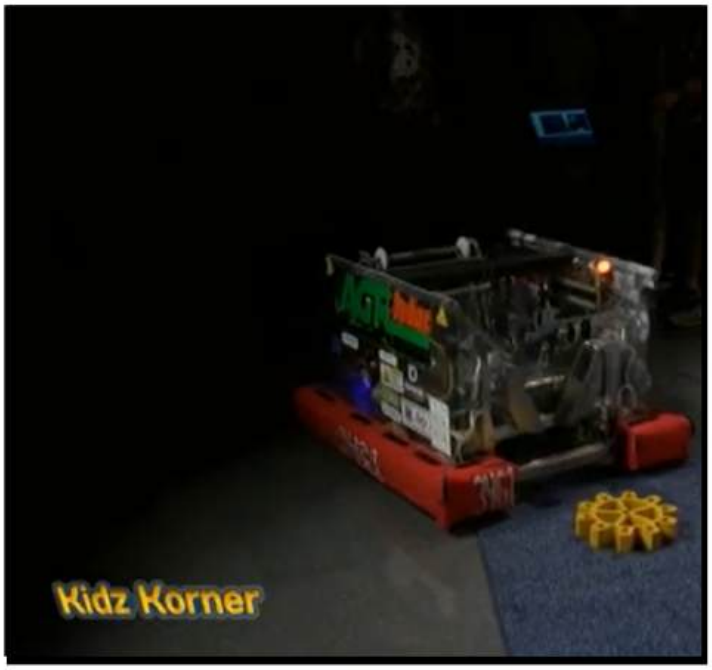
Alien
-5$
STRIKER
WINNER EVERY TIME
Win a Prize Everytime!

3461

# PROMOTING FIRST

As technology and science grow to new heights, fostering a culture that prioritizes collaboration, creativity, and gracious professionalism is pivotal. FIRST goes beyond the realms of traditional robotics competitions by instilling values that extend beyond the arena, emphasizing the development of skills such as teamwork, critical thinking, and adaptability. Therefore, it's crucial that we champion the ideals of FIRST within our local community.

We've taken many different routes to make our message known locally.




## NUTMEG-TV

NutmegTV is a local broadcasting company located in Farmington, CT. For the past thirty years, they have provided award-winning media production for a variety of companies within their 1,400 sqft space.

In 2017, the team was offered to do a thirty-minute segment on NutmegTV. This segment highlighted our 2017 robot "Hailstorm", as well as the skills students can learn when they partake in a FIRST Robotics Competition team. We are invited back to do another special in 2024!

## STATISTICS

- Broadcast Year: June 2017 & April 2024
- Student Speakers: 10
- Length of 2017 Segment: 29:42

## FARMER'S MARKET

The Bristol Farmers Market is a local market run at the heart of the city near the Bristol Health Medical Center. The season runs from mid-June to the end of October each year, reoccurring every Saturday.

For the past three years, Operation P.E.A.C.C.E. Robotics hosts a booth at the market to showcase the robot to the local community, and to sell our famous taffy. We let people interact and even get hands-on with the robot, throwing balls back to it as well as showcasing it's capabilities for competition.

## STATISTICS

- Years Attended: 2019-2023
- Attendance Per Market: 750
- Total Impacted: 2,250

# OPERATION INNOVATION

# OUR MISSION

## OUR GOALS

**1 CREATE OPPORTUNITY**

Create accessible classes to build foundational skills

**2 MAKE STEM FUN!**

Provide lifelong fun in STEM through activities

## OVERVIEW

In 2020, Operation P.E.A.C.C.E. Robotics proposed a new STEAM program designed to offer a learning opportunity to kids aged 6 to 18 with experiments, build projects, and workshops; called Operation Innovation (OI).OI looks to break down barriers in STEAM education by focusing on accessible, low-cost, and effective lesson plans.

Although our initiative was founded in 2023, we've conducted activities since 2017 through our Java classes. We expanded our classes in 2022 by creating a cirriculum for Design and CAD. Today, these classes have seen over 20 students build important skills to STEAM, and have major plans to expand for the 2025 season.

## OUR FUTURE PLANS

In addition to running our annual classes, PEACCE has designated 2 new ways we can power STEM in Connecticut:

- XRP Kits at the Bristol Library: Throughout 7 weeks, students will be challenged to learn Java by programming FIRST-supported XRP kits to tackle challenges from the NE FIRST Minibot Challenge. By the end, we aim to empower the next generation of innovators with the skills to succeed in programming.
- "STEAM on the Road": to address the need for fun experiences in our community, we've prepared a variety of challenges to tackle the different skills in STEM. For example, participants can dive into learning with our bristlebot and wooden robot kits, where they'll work with PEACCE members to design and assemble their robots before competing in a timed race. These challenges will rotate at each of our community events, leaving a variety of skills for students to learn!
    - Some Activities: 3D printing pens, wooden robot kits, solar-ovens, bristlebot races, elephant toothpaste, slime, etc.

# OFF-SEASON TRAINING

A goal of Operation P.E.A.C.C.E. Robotics is to pass on knowledge to students every year, no matter if they are part of not part of the team. To accomplish this, our team has set up annual workshop classes that take place throughout the summer, leading up to our build season in January.

Our Workshop Classes aim to cater to ages 13-18. These classes teach students how to use tools, make simple build projects, and come up with innovative solutions to problems. Some of these workshops will include:

- How to Solder
- Basics of Power Tools
- Basics of Programming

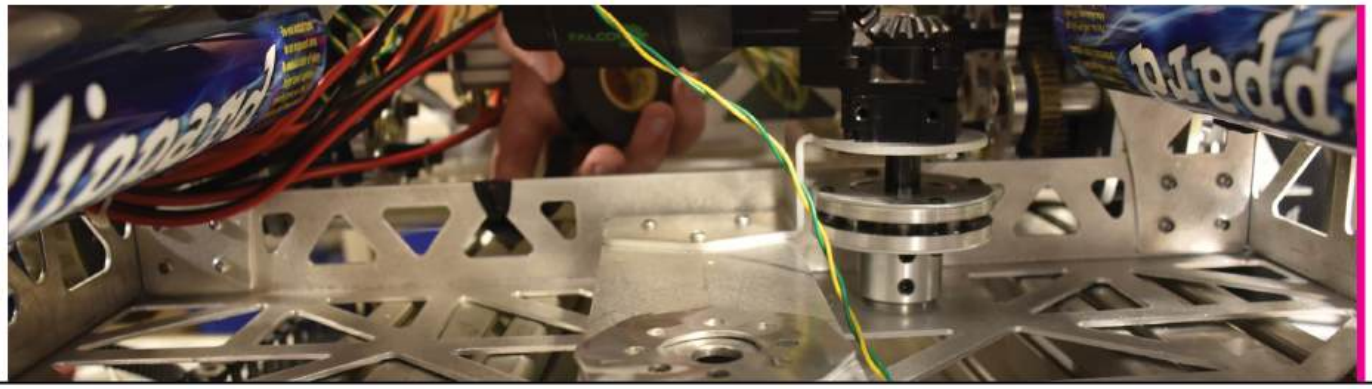
We've launched these classes since 2017 to be both in-person and virtual through Google Meet.

## HOW DO WE PROMOTE THESE CLASSES?

Our advertising starts immediately at our team's Open House every year. The Open House is a way for parents and students grades 7+ to meet the team, interact with the robot, sign paperwork, and overall join the team's season.

When a student is on-boarded, we let them join our Slack, where they receive updates for when weekly classes are, and the agenda tackled for that session. By build season, students have learned the basics skills needed to partake in STEM and join the field of their choice.

We also promote these sessions online using social media, such as Facebook and Twitter, to get the word out.



# JAVA PROGRAMMING CLASSES

Since 2017, our team has run a Java programming class open to the public, and it has proved to be our most popular class. Run by both mentors and students, attendants work to create projects such as building a functional Tic-Tac-Toe game and writing a program to control our robot. By the end of the class, members should be ready to program basic robot code!

## GOALS

- Build literacy in basic coding terms
- Understand the layout of team-standard programs such as Visual Studio Code
- Create effective programs the utilize skills that are frequently used in robot production

## PROGRAMS

- code.org
- Scratch
- Visual Studio Code
- WPI Library
- Languages
  - Java

## FACTS

- Annual Attendance: 6-10 kids per class
- Session Time: around 1.5 hours
- Mentors: 1
- Students: 2

# CAD & DESIGN CLASSES

In addition to our programming classes, we try to offer sessions where attendants can get hands on with assembling and manufacturing the robot. This class has also proven useful, as it builds necessary design skills that are utilized within STEM fields. Our team hosts lessons that include soldering, tool literacy, and even CAD-ing robot parts.

In 2021, our team put our attendants to the test with a mini-bot competition. In the Fall, we gave a challenge to shoot small tennis balls, and two teams sought to built a robot to compete. Using the skills they accumulated, they competed three weeks later.

## GOALS

- Build literacy in design and machining such as drill presses and Gene Haas VF6s
- Utilize programs used throughout the workforce, such as Solidworks
- Create products that are robust in design, lightweight, and effective in purpose

## PROGRAMS

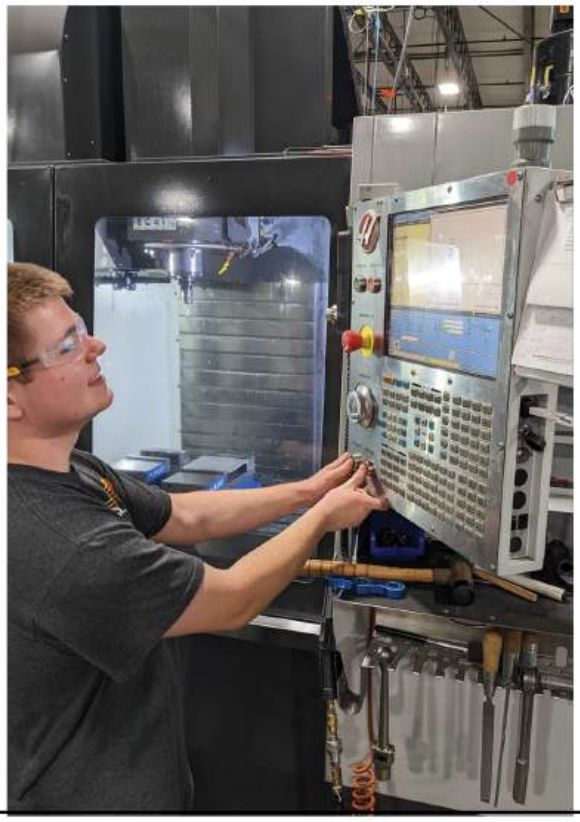
- Solidworks
- Onshape

## FACTS

- Annual Attendance: 2-6 kids per class
- Session Time: around 2 hours
- Mentors: 4
- Students: 2

## MINIBOT COMPETITION

- Team Attendance: 2



# OUR NEW PROJECT PROPOSALS

## TIMEFRAME & OVERVIEW

### XRP KITS

- 2 Classes over 7 Weeks
- 4 Challenges Maximum
- Utilize WPILib
- Taught by students, mentors, and volunteers

### STEAM ON THE ROAD!

- Provided at applicable outreach events
- Challenges change per day/event
- Will have guides alongside events to do at home
- Increase fun in STEAM!

## SAMPLE BUDGET

| BRISTOL LIBRARY XRP KITS | | | | |
|---|---|---|---|---|
| ITEM | DESCRIPTION | | COST | NOTES |
| XRP Kits | Robotics kits used for the classes | | $114.95 | $114.95 per one FIRST teams receive discount |
| Space Rental | Space @ Library | 2 meetings x 7 weeks | ? | |
| Extension Cords | Extension Cords for Laptops & Batteries | | $14.99 | need 5 |
| Mats | NE FIRST Minibot Challenge Mats | 4 | ??? | Inquire with NE FIRST |
| Wooden Table | Custom Made for mats | 2 needed | $75 | |
| | | | | |
| "STEAM ON THE ROAD" | | | | |
| Bristlebot Kits | Kits avaliable @ events for students | Unknown units | $2.00 | |
| 3D Printing Pens | Pens for activities | 2 Pens, 2 orders of PLA filament, 2 silicone mats, 1 extension tower | $113.73 | Can be increased |
| Low Cost Robot Hand | To learn abiut joints and muscles | Cardstock, plastic straws, scissors, yarn | $78.92 | Can be increased |
| Solar Ovens | To teach about conductivity & reusable energy | Construction paper, pizza boxes, markers, plastic wrap, food | $135.72 | 1 Order = 12 ovens |

# STEAM OUTREACH

# FULL STEAM AHEAD

## WHAT IS STEAM?

STEAM is an acronym that stands for Science, Technology, Engineering, Art, and Mathematics. These five words create the basis of our mission, and what we look to promote within our community. While community outreach looks to build a connection with those around us, our STEAM outreach intends on building foundational skills within these fields, as well as create long-lasting technical connections with those who support our mission.

This section will cover classes we have provided for third party organizations, and demonstrations that have built a foundation with some of our STEAM-based sponsors.

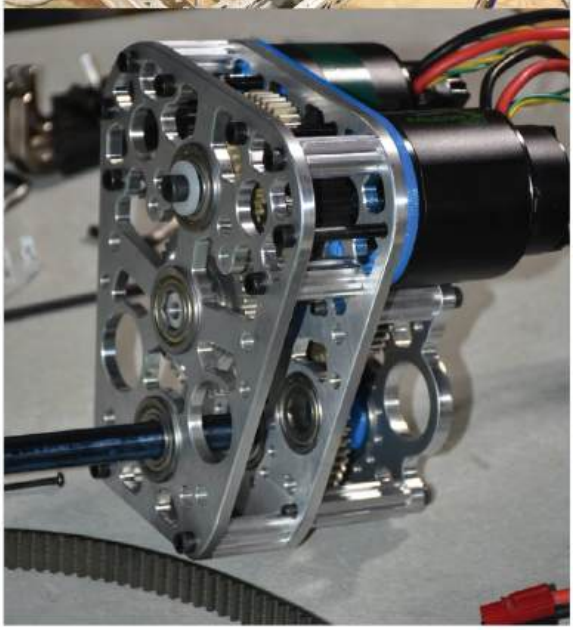
## SUSTAINING OUR MISSION

In order to sustain our mission, we find organizations that share our vision and passion. One of these ways is by connecting with sponsors and creating an equally-providing relationship. We have many consistent sponsors who give us financial support. Our most notable sponsor, the Arthur G. Russell Company, provides us our build space, gives us complete access to their shop tools and machines, and contributes financial aid. Our students have a close working relationship with the engineers and machinists, they provide guidance and advice on our designs.

We partner with many other companies, such as

- Thomaston Savings Bank
- Automation Associates
- RBC Bearings
- RTX

We thank our sponsors every year for their involvement with our program.



# OUR PARTNERSHIPS

## SENATOR HENRI MARTIN

In May 2023, we invited our local representative, Senator Henri Martin, into our space for Manufacturing Month to learn about FIRST and its impact on the workforce in Bristol. During his visit, we spoke about the skills students learn on the team, alumni's career aspects after the team, and the importance of opportunities like ours. Senator Martin has become a vocal proponent of promoting STEM programs in his district and encourages local politicians to follow.

## BRISTOL CITY COUNCIL - MRS. THIBEAULT

On June 4, 2023, our team demonstrated our robot at our open house, where we presented to Cheryl Thibeault from the Bristol City Council once again. We were able to speak about the importance of Bristol STEM programs and how it impacts the future of manufacturing. She has been an avid supporter of our program, and we can't wait to work with her more!

**SEE HER POST BELOW!**

## 4-H

4-H has been our most avid supporter since day 1. 4-H's programs allow us to recruit from students from anywhere, regardless of their school and education status. 4-H has supported us by showing up to our open houses, meeting our students, and letting our spread our mission all across Connecticut. We show our appreciation by supporting their programs, attend their fairs, and more!

**READ OUR FEATURE ON HARTFORD 4-H'S PAGE!**

# BRISTOL B&G CLUB

In 2016, we established a STEM Curriculum at the Bristol Boys and Girls Club for their after school program. This was the first of its kind to be introduced in any Boys and Girls Club in Connecticut, other clubs have since used our program as a model to create their own.
The classes included at the Bristol Boys and Girls Club were basic coding, game design, CAD using Inventor and 3D printing, Vex IQ, and an FLL team, geared towards 3rd to 5th graders as a stepping stone into technology. We reach over 300 students per session through this initiative.

With this curriculum, the Bristol Boys and Girls Club has been able to apply for new grants raising over $30,000. Through these grants, a permanent paid position was created for our team to head the "Tech Room." One of our former members, Johnny Chea, was a Dean's List Finalist for his outstanding volunteer work with this program. In October 2018, we started an additional VEX Robotics program at the New Britain Boys and Girls Club for ages 10 and up.

## INFORMATION

- Created the "Tech Room"
- Founded by Dean's List Finalist Johnny Chea
- Raised $30,000 in grants
- Started FLL and VEX teams
- 300+ Students per session

## ACTIVITIES

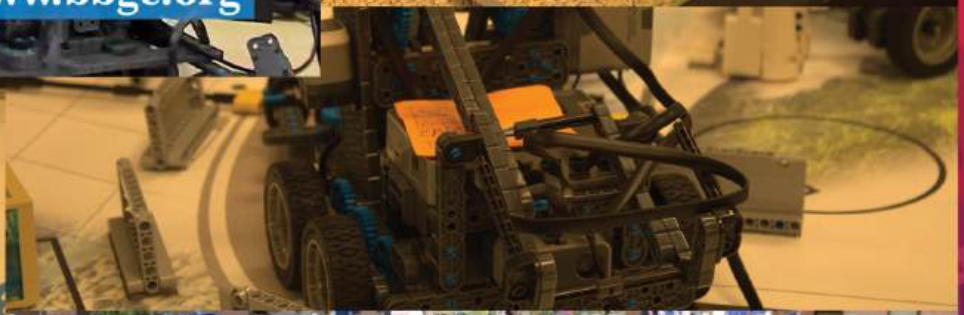
- LabVIEW programing class 2014 with around 8 students per class

# CLUB FAIRS

In addition to other outreach, we also reach out to local schools to do demonstrations at their club fairs. We reached out and demonstrated at Lewis Mills High School in 2017, as well as a few other high schools in the area for grades 8-12.

We intend to keep doing this in 2023 and beyond with schools such as Harwinton-Burlington, Lewis Mills, Imago Dei Classical Academy, and more.

www.bbgc.org



We ♥ Questions
About Robotics

# MANUFACTURING CT

Founded in 1913, ManufactureCT, (formerly New Haven Manufacturers Association) is among the longest-running industry groups to serve manufacturers in the United States. This coalition of companies spans several firms that make precision instruments for medical and aerospace industries, security devices for information systems, specialty chemicals, fixtures in metals, plastics, and other materials using a range of technologies and processes from 3D printing to traditional stamping and machine tooling, and more. Some have been operating as family businesses for several generations, others are larger, multinational corporations.

In the spring and summer of 2022, we were humbly invited to take part of this group by one of our title sponsors, Arthur G. Russell. As members of several manufacturing companies toured the space, we demonstrated our robot and the true commitment we have to spreading STEM within our community.

## STATISTICS

| | |
|---|---|
| **YEARS ATTENDED** | 2022 |
| **DATES OF LAST ATTENDANCE** | 2022 |
| **PEOPLE IMPACTED AT LAST ATTENDANCE** | 50 |

# RBC BEARINGS DEMO

In 2022, Operation P.E.A.C.C.E. was fortunate to have RBC Bearings join as a sponsor to our team. Founded in 1919, RBC Bearings Incorporated is an international manufacturer and marketer of highly engineered precision bearings and products, which are integral to the manufacture and operation of most machines, aircraft, and mechanical systems, in order to reduce wear on moving parts, facilitate proper power transmission, reduce damage and energy loss caused by friction, and control pressure and flow.

To show our thanks, we showcased our robot to the engineers at the lab, as well as showcased what kinds of bearings we used to design the robot. The event was a great success and we can't wait to go back in future years,

## STATISTICS

| | |
|---|---|
| **YEARS ATTENDED** | 2022 |
| **DATES OF LAST ATTENDANCE** | 2022 |
| **PEOPLE IMPACTED AT LAST ATTENDANCE** | 8-10 employees |

3461

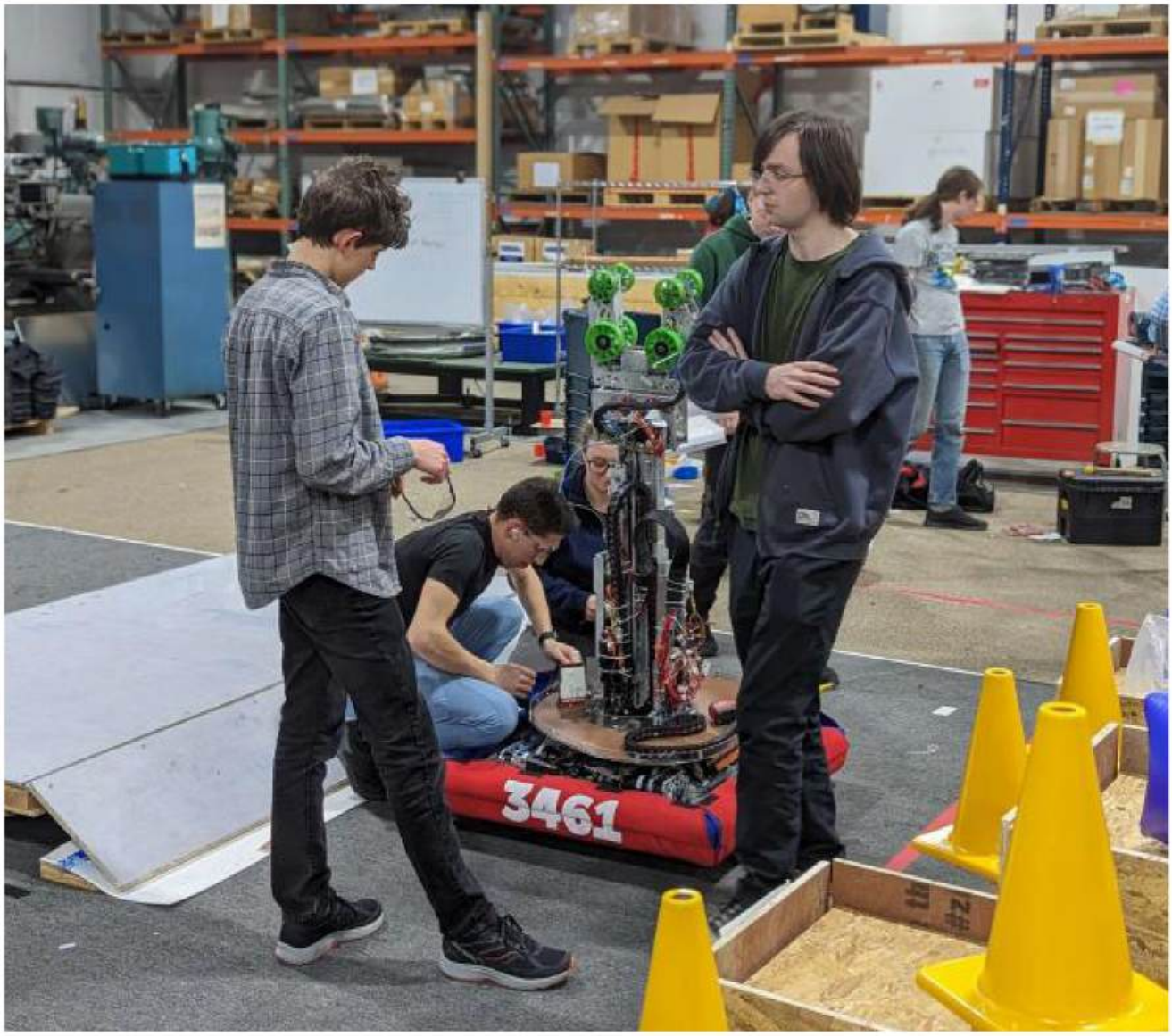
# FIRST OUTREACH

# FIRST IS A COMMUNITY

In the spirit of FIRST, we frequently practice the key philosophies that define this organization: Gracious Professionalism and Co-opertition. The spirit of competition does not mean our opponents are necessarily just that, but also members of our huge FIRST community. We treat everyone we come across as members of one big family, and frequently promote this ideology through becoming a prominent figure within the Connecticut FIRST community.

We try to embody this mission in everything we do. We create documentation with the purpose of spreading our knowledge to our students and the community beyond. We also offer our space and materials to any team who asks, including access to our practice field.

Within the past six years, we have opened our doors to seven local teams, and intend to continue this mission in years beyond.



# C.C.R.A.

Founded in 2022, the Central Connecticut Robotics Alliance (CCRA) is a multi-team collaboration between FRC 178 (The Second Law Enforcers), FRC 1071 (MAX) and FRC 3461 (Operation P.E.A.C.C.E. Robotics) to create accessible STEM within Connecticut, by creating a community field space, accessible to all FIRST teams. Currently, we are focusing on our fundraising initiatives to fuel our organization's future.

## STATISTICS

| | |
|---|---|
| **YEARS ATTENDED** | 2023 |
| **DATES OF LAST ATTENDANCE** | 2023 |
| **PEOPLE IMPACTED** | 60+ Golfers |

GIFT BAGS!!!

BBQ COOKOUT DINNER!!!

# CCRA 1ST ANNUAL GOLF TOURNAMENT

Join us for an exciting day of golf on one of Farmington Valley's most scenic 18-hole courses. All proceeds benefit our three FIRST High School Robotics teams.

**BLUE FOX RUN GOLF COURSE, AVON, CT - SATURDAY, OCTOBER 1ST, 2022 9:00 - 2:00**
**$95 PER GOLFER**

GOLF.CCAROBOTICS.ORG

CONTINENTAL BREAKFAST!!!

RAFFLE PRIZES!!!

# OPENING OUR SPACE

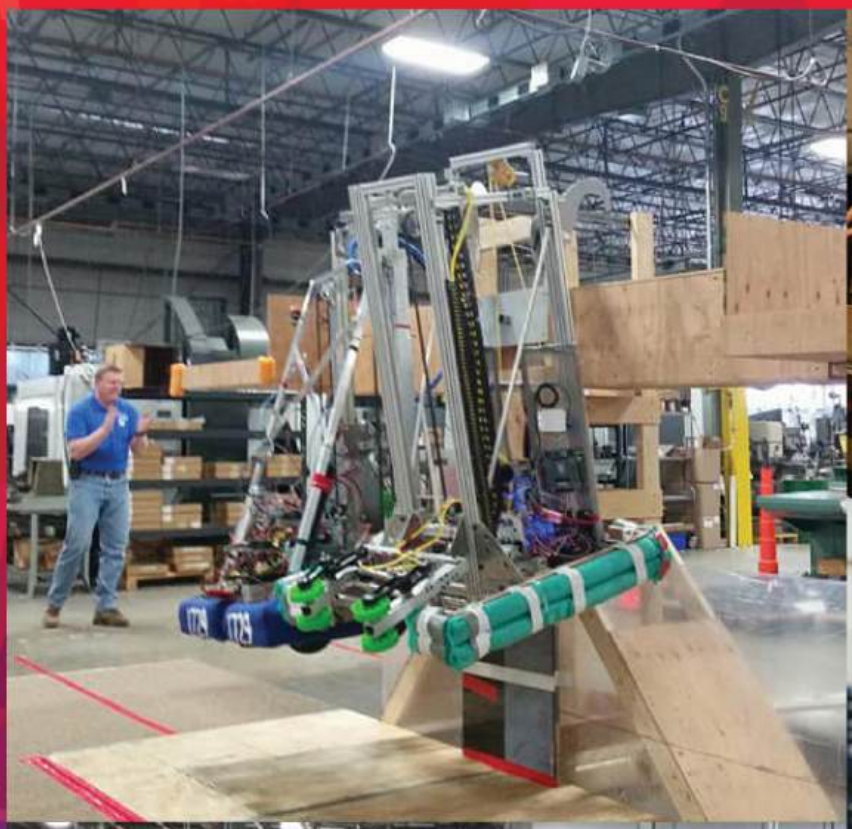
Every year, Operation P.E.A.C.C.E. Robotics opens up our space to teams around the world to come and gain assistance from our team. We allow access to all our tools, machining, mentor knowledge, and even a custom-built wooden practice field for the annual game. This allows invaluable practice to teams in the area.

Additionally, In the summer of 2018, an FRC team, team 7662, Buzzbots, from Missouri, was looking for guidance in starting up their own team. We offered the needed help and instruction and showed one of their new mentors around our shop when she came to see what our program was like. In October 2019, we lent out our robot to team 4420, Swarm Storm, a rookie team, in need of a robot to participate in Bash at the Beach, an offseason competition. Two of our mentors have also volunteered at the tool space in the Waterbury event since 2014, and frequently volunteer at the Where In Wolcott Invitational (WIWI).

Our help extends far beyond this, we try to help teams all the time at events through lending a part, assisting with code, and planning strategies.

## TEAMS INVITED

| TEAM NUMBER | DATE(S) |
|---|---|
| **178** | February 2024 |
| **1071** | March 2022 |
| **7662** | June 2018 |
| **1729** | 2019 |
| **228** | April 2022 |
| **NOTE:** Teams mentioned above have attended several times to our space. The dates above mark their most recent visit. | |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# FUNDING FOR FIRST

**"What is the biggest problem teams face towards their sustainability?"**

## OVERVIEW

During the 2023 season, our team approached many teams at our events with the question above. Out of 32 teams we interviewed, every single one said the same answer: Funding. So we invited FRC 1153, the Timberwolves, to create the inititaive Funding for FIRST.

## MISSION

***To increase funding awareness within the FIRST community by providing opportunity and resources.***

## RESOURCES

- Database specficially tailored to find grants for FIRST teams
  - Include tags to narrow down searches, including location and funding amount
- User-generated articles and submissions
- Free resources to help increase documentation

**FILL OUT OUR INTEREST FORM HERE!**

## TIMELINE

CURRENTLY: Still In Development
April 2024: Begin official branding & front end development
May 2024: Website Alpha avaliable for preliminary testing
May 2024: first wave of updates begin
July 2024: Submission portal opens
October 2024: Beta Release for Public
October 2024: User articles avaliable
December 2024: Feedback forms due

**PROOF OF CONCEPT**

# HELPING FIRST

## CREATING 4-H ROBOTICS AROUND THE WORLD

During the 2024 season, our team was reached out to by prospective students in Canada to start the first ever 4-H Canada robotics team. To assist in their vision, our team is currently collaborating to create documentation for their project. This will cover not only their project, but will serve as a template to help start 4-H robotics across the world.

Currently, we are in the second draft of this proposal, and we intend to finish it by June 2024.

## VOLUNTEERING

FIRST is run by the power of volunteers, and our events wouldn't happen because of them. To show our support and give thanks, our team makes it a mission to volunteer every year. Currently, we have volunteered over 801 hours over three years, and plan to keep volunteering at competitions in 2024!

**HOW DO WE REPORT STATISTICS?** Our team runs a clock to log hours. At the end of competitions, team members figure out their hours at competition, and log it onto the volunteer sheet.

## ASSISTING FIRST

In addition to volunteering and starting FIRST, we help out everywhere we can. Here is a brief list of our activities:

- Mentored & Assisted FTC 19857 EPIC Odyssey from TX by giving advice on CAD, programming and team operations.
- Assisted FRC 7459 Taubatexas from Brazil when they needed a new PDH. We sent them a brand new one and have kept open contact with them for future needs.

# FINAL WORD

## SUBJECT TO CHANGE

As Operation P.E.A.C.C.E. Robotics continues to evolve and change as a team, so does our outreach. As a result, our outreach is subject to change or be updated in any shape or form from previous years.

This also means that additional content can be added between iterations. Not all of our outreach is reported in our binders. To learn more, please seek out a team member to learn more information.

***Last Iteration: 3/07/2024***