

The logo features a stylized profile of a Trojan warrior's head, facing right, set within a gear-like shape. The gear has eight teeth and is filled with a gradient from yellow at the top to red at the bottom. The Trojan head is rendered in a dark red color. The entire logo is centered on a solid red background. Two horizontal yellow lines cross the logo, one above and one below the text.

TROJANATORS 5740

2023



Dedicated to Woodie Flowers

"Competition for the sake not of destroying one another, but for the sake of bettering and improving both competitors as a result of the competition." -Woodie Flowers

The logo features a large yellow gear with a red outline. Inside the gear is a red silhouette of a Trojan horse. A red banner with a yellow border is positioned horizontally across the center of the gear, containing the text.

**FRC TEAM 5740
TROJANATORS 2023
NON-TECHNICAL BOOKLET**

TABLE OF CONTENTS

1. TEAM INFORMATION	1
<i>Team Foundation</i>	
<i>5740 by the Numbers</i>	
<i>Team Awards</i>	
<i>Leadership Structure</i>	
<i>Title Sponsor</i>	
<i>Sponsors</i>	
<i>Sponsor Relations</i>	
<i>Alumni Today</i>	
2. CURRICULUM AND CAREER DEVELOPMENT	13
<i>Curriculum Impact</i>	
<i>FIRST Class Robotics</i>	
<i>In-Reach</i>	
<i>Career Development</i>	
<i>Introduction to STEM</i>	
3. SERVICE THROUGH STEM	22
<i>Toy Adaptation</i>	
<i>Seniors FIRST</i>	
<i>STEM Camps</i>	
<i>School Involvement</i>	
<i>Christmas on Troy Hill</i>	
<i>Inclusive Games</i>	
<i>Montessori</i>	
<i>FIRST Awareness</i>	
<i>FRC Bootcamp</i>	
4. FIRST EXPANSION	39
<i>FLL Pathways to Inspiration</i>	
<i>FTC Far & Wide</i>	
<i>FRC Coming Full Circle/Innovation in Communication</i>	
5. POLITICAL ADVOCACY	47
<i>PACT Legacy</i>	
<i>SASA-NAC</i>	
<i>TRETC Conference</i>	

OUR TEAM





TEAM INFORMATION

Team Foundation

MISSION:

To build students of creativity, leadership, and professionalism - connecting them to a future enlightened by their STEM experiences.

VISION:

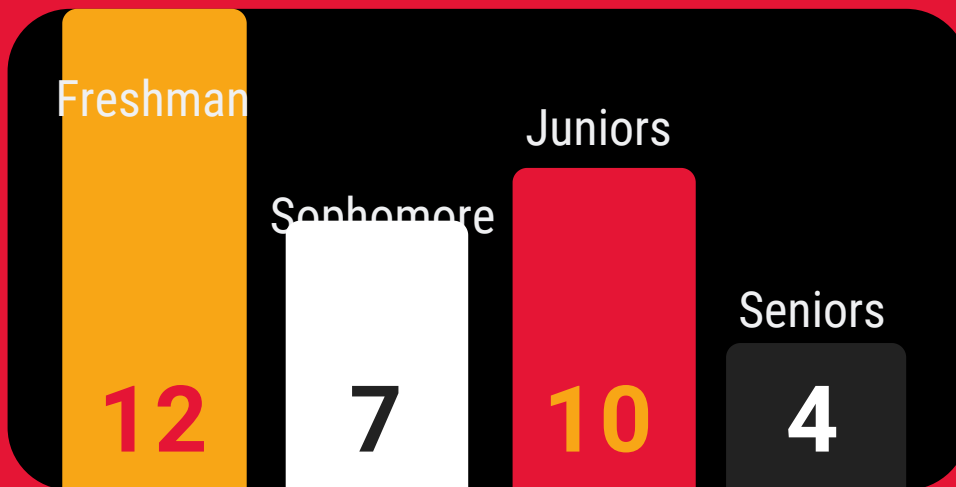
To see our communities served by our team members, equipped with gracious mindsets and professional skill sets.

TEAM FOUNDATION:

5740 was founded to create STEM opportunities within our community.

5740 BY THE NUMBERS

Teams we started and/or mentored:



33
students

100%
of outreach is student
executed.

10
mentors

TEAM AWARDS

————— **2015** —————

Rookie Inspiration Award

————— **2016** —————

Verizon App Challenge

————— **2017** —————

Dean's List Finalist

————— **2018** —————

Engineering Inspiration
\$100,000 Kahn Family
Foundation Grant

TEAM AWARDS

————— **2019** —————

Dean's List Finalist
Dean's List Award Winner
Engineering Inspiration

————— **2020** —————

Chairman's Award

————— **2021** —————

Dean's List Finalist
Chairman's Award

————— **2022** —————

Dean's List Finalist
Woodie Flower's Award Winner

LEADERSHIP STRUCTURE

TECHNICAL TEAM LEADS



MECHANICAL
J.R. Hufnagel



CONTROL SYSTEMS
Bridget Culley

NON-TECHNICAL TEAM LEADS



FIRST IMPACT
A.J. Yellin



**BUSINESS
& MEDIA**
Justin Lauffer



**STRATEGY
& SCOUTING**
Ethan Lu

TITLE SPONSOR

PENNA  **FLAME**

Established 1968

We would like to thank our generous 2023
Title Sponsor: Penna Flame Industries



We recently toured their facility which specializes in flame hardening, precision surface hardening, induction hardening, cryogenics, and metal stress relieving.

CORPORATE SPONSORS

Legacy.

ARMSTRONG

Gold

JEREMIAH BONDRA DMD, PC

GENE HAAS FOUNDATION

Scarlet

MITSUBISHI ELECTRIC POWER PRODUCTS INC.

LIGHTSPEED BUSINESS CONSULTING

TOTAL EQUIPMENT COMPANY

RAILWORKS

FUN FORE ALL

BD MATCHING GRANT

Friends

JOSEPH J. BRUNNER, INC.

HERFF JONES LLC

CRANBERRY TOWNSHIP DAIRY QUEEN

CRANBERRY DENTAL STUDIO

SCHELL GAMES

EDWARD JONES

FAMILY SPONSORS

Gold

BOBBIE & WILLIAM PETERSON

Scarlet

GERLOFF FAMILY

JOHN & MARIE PASERBA

SIGNORIELLO FAMILY

Friends

HUFNAGEL FAMILY

CULLEY FAMILY

CHARMAINE RAPKO AND AUNTS

FECZKO FAMILY

HUBA FAMILY

RAYMOND A. & JENNIFER RAPKO

SPONSOR RELATIONS

We greatly appreciate our sponsors and show our gratitude by inviting them to regional events where they can meet the team, experience a FIRST event, and see the robot in action.

They are also invited to our end of the year banquet to celebrate a successful season. There they receive a team t-shirt and commemorative photo.



ALUMNI TODAY

Our 47 alumni stand out and are making a difference!



Examples Include:

Anna Rutowski (2017) published a book called "Nanoparticle SuperHeroes Defeat Evil Microbes".

Matthew Esser (2018) has begun research at OSU.

Sophia Wiest (2018) is working diligently to start FIRST teams near Penn College.

Thomas Franco (2020) has begun research at PSU and has gained many internship opportunities because of his FIRST experiences.

Peyton Jones and Gavin Krebs (2021) and Benjamin Bollman (2022) have followed the FIRST pipeline to Kettering University.





Curriculum &
Career Development

CURRICULUM IMPACT

9
STEM
Electives

500+
Students
Involved

- AP Computer Science Principles
- Engineering 1: Introduction
- Engineering 2: Engineering by Design
- STEM Choice
- Introduction to Electronics
- Honors Intro to CAD
- FIRST Class Robotics I
- FIRST Class Robotics II
- Into to Computer Science

STEM CLASS

5740 inspired the development of a STEM Choice Class, where students can customize their STEM experiences.

FIRST CLASS ROBOTICS

FIRST Class Robotics I:

A project-based course designed to work in parallel with the FIRST Tech Challenge robotics competition on FTC 12578. Students are divided into sub-teams based on interest. Co-curricular approach provides FIRST opportunities.

FIRST Class Robotics II:

Offered to students who will serve as sub-team leads. Students are directly responsible for project management. They create schedules, delegate tasks, establish accountability, and oversee the design cycle.



60+
Students Involved



IN-REACH

5740 In-reach refines our students' technical skills prior to build season. Sessions are taught by our mentors and student leads, twice a week for 6-8 weeks. This year, we focused on CAD and Software skills. In-reach allows us to work with purpose, to increase efficiency, and to grow the skills of our new team members.

CAD



Software



CAREER DEVELOPMENT

40+

**Career
Development
Opportunities**

500+

Students Involved

Field Trips and Career Action Plan (CAP) Talks

Includes local businesses and sponsors, allowing the student body to explore STEM careers and industries.

CAP Talks and Field Trips allow the student body to learn valuable knowledge from industry professionals. Many speakers are representatives of 5740 sponsors and even mentors!

CAREER DEVELOPMENT



3

Students have been hired by our engineering sponsors as employees in various capacities.

Our students work with our school's career development office to strengthen our team's professional networking skills.

INTRODUCTION TO STEM

2 women from 5740 attended a Westinghouse Women in STEM Day. The female engineers explained the branches of engineering and female role models in the industry.

The students also toured the nuclear engineering training facility and were taught about the training process. Finally, there was a Q&A panel with the female engineers so the students could obtain a better understanding of their roles in engineering.



"Learning about different fields of engineering I wasn't aware of before really widened my view of STEM opportunities. The entire experience was interesting, and connecting with fellow women who enjoy stem was a great time." - Sophia Signoriello







SERVICE
THROUGH STEM

TOY ADAPTATION

In Summer 2019, we kicked off our toy adaptation project, where 5740 students utilized their technical skills to adapt toys for medically fragile children. These toys provide opportunities for children to play by removing the need for dexterity and fine motor skills, making them developmentally appropriate for any skill and ability level. We donated the toys to The Children's Home & Lemieux Family Center where they are available to over 40 children on a daily basis.

35

Toys Adapted

\$3,500 Invested

**\$1200 sponsored by our team Boosters
and \$2300 raised via an all-school
fundraiser.**

"Toys like this are not only expensive, but very hard to come by; and we truly appreciate their hard work to make sure our patients get the most from development through play. They really spread a special kind of joy to our children here," - Pam Keen, CEO of The Children's Home & Lemieux Family Center.



SENIORS FIRST

Visited

5

Different Senior Living
Communities

200+

Residents Involved



5740 shares our FIRST and STEM experiences with the residents. We share our outreach initiatives, demonstrate our robot, and present information about cyber security.

"As a 1955 graduate of North Catholic, I was proud to attend the NC Robotics presentation at Sherwood Oaks. We certainly didn't have anything like it when I was a student. As a Pitt Engineering graduate with a B.S. and M.S. in Metallurgical Engineering I am always pleased to see the STEM courses being emphasized. The residents loved the program and especially the one-on-one technical help from the students." - Frank Weiss

STEM CAMPS

5 YEARS

200+ KIDS

MORE THAN A ROBOT:

Teaches FRC basics: CAD, construction, electronics, programming, business, media, and awards. Promotes teamwork and Gracious Professionalism.

Campers learn that robotics is truly "more than a robot" and that the team is more of a family.

Campers get the insight into technical and non-technical aspects. Our team also promotes that both are of equal importance.

STEM CAMPS

SUMMER AT NORTH CAMP:

Our team provided an inside look to the STEM and FIRST experience through our school's summer camp.

Campers were introduced to both the technical and non-technical aspects of our team, broadening their view of robotics club and what it means to be a team.

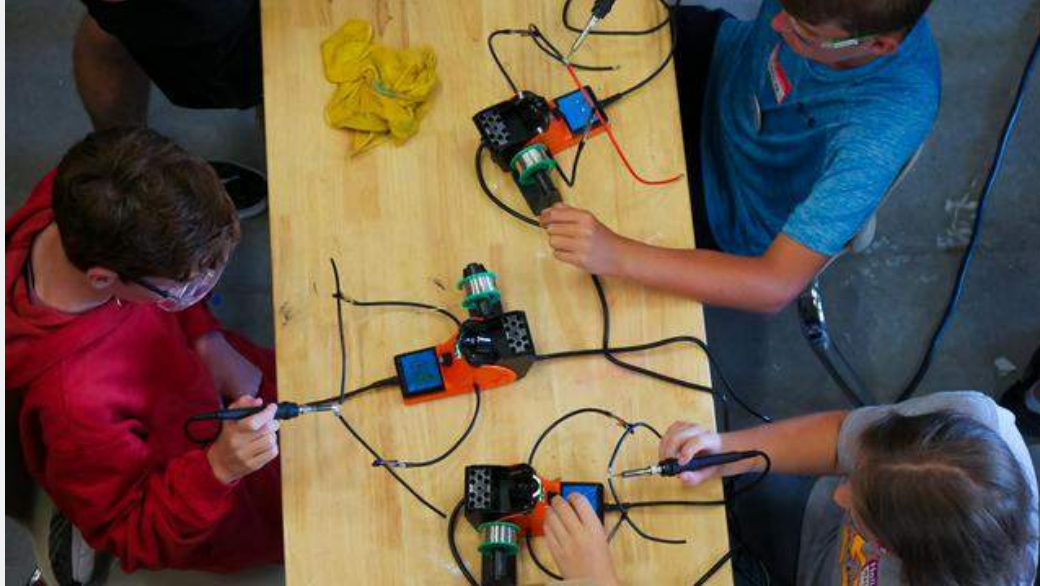
Week 1:

This week was dedicated to incoming 7th through 9th graders.

Campers were introduced to business, CAD, building, and software. At the end of the week there was a mini competition run similar to an FTC event.

Week 2:

This week was dedicated to 4th through 6th graders. Campers were introduced to CAD, software, and button making. The building aspect reflected FLL, where the campers used Legos to build their attachments.



SCHOOL INVOLVEMENT

Since 2015, 5740 has run a robotics table at school open houses in the fall and spring for families interested in North Catholic. We introduce them to the FIRST Program and share team history and personal stories.



We also demo our robot at Scarlet and Gold Day, where 8th graders in the community come to North Catholic to experience a day as a high school student.

CHRISTMAS ON TROY HILL

Since 2017, 5740 has brought robots to an underserved Pittsburgh area. Every December, the school assists these families on Troy Hill with gifts and a warm meal.



We brought our FRC robot and gave kids the opportunity to test drive the robot. We created a friendly competition style game and gave out small prizes to every participant. We also ran a button station for the kids to make custom buttons to take home.

MONTESSORI

On Valentine's Day, we brought FIRST concepts to a pre-school! We demoed LEGO Boost and explained how fun robotics is. We read them stories, used LEGO Duplo to build a train track with a color sensor, and made custom robot stickers with the children for them to keep.



FIRST AWARENESS

Cranberry Maker Fair

5740 operated a booth at the Cranberry Maker Fair, an event seeking to demonstrate STEM to the local community. The Maker Fair was also an opportunity for industry professionals to showcase the many opportunities in their industries. We demoed our robot along with two other FRC teams.



Tech Takeover at PNC Park

5740 attended the Tech-Takeover event at PNC Park during a Pittsburgh Pirates baseball game. Throughout the game, we demonstrated our robot along with several other FRC and FTC teams. Baseball fans enjoyed seeing our robot climb on the hanger.



FIRST AWARENESS

Mars New Year

5740 has demoed for FIRST and the Mars New Year community event. The town of Mars celebrates the planet Mars' new year with science and alien activities. FLL and FRC teams from the area demo their robots to the crowd, host fun games, and let the kids drive the robots.

8,000+ People Attended!



STEAM Carnival

5740 participated in the STEAM Carnival Education Day at The Pittsburgh Children's Museum! We demoed the robot at our tent and let the children operate the robot. The kids also played with LEGO BOOST and Mindstorms robots to show multiple levels of FIRST.

1,000+ People Attended



FIRST AWARENESS

STEM Fest

In October 2019, 5740 attended the STEM Fest at Robinson Mall to demo the robot. This event had 1,000+ attendees!



Boy Scouts

We demoed FIRST Robotics to the Boy Scouts with FRC 4049 where we talked to the scouts and let them drive the robots.



FIRST AWARENESS

Girl Scouts:

We hosted a STEM learning experience for a troop of Girl Scouts. We helped the Daisy and Brownie troops earn their robotics badge.



A girl scout was asked if she was interested in robotics and she said, “no way”. After the program, we asked the troop if they would be interested in joining robotics, and the same girl scout was the first to raise her hand with much enthusiasm.

FIRST AWARENESS

Mask Initiative:

We created a mask initiative to bring masks to local healthcare facilities. We fabricated over 1000 masks. A foreign exchange student used our mask fabrication manual to get 300+ masks donated in Thailand.

#FIRSTfightsCOVID

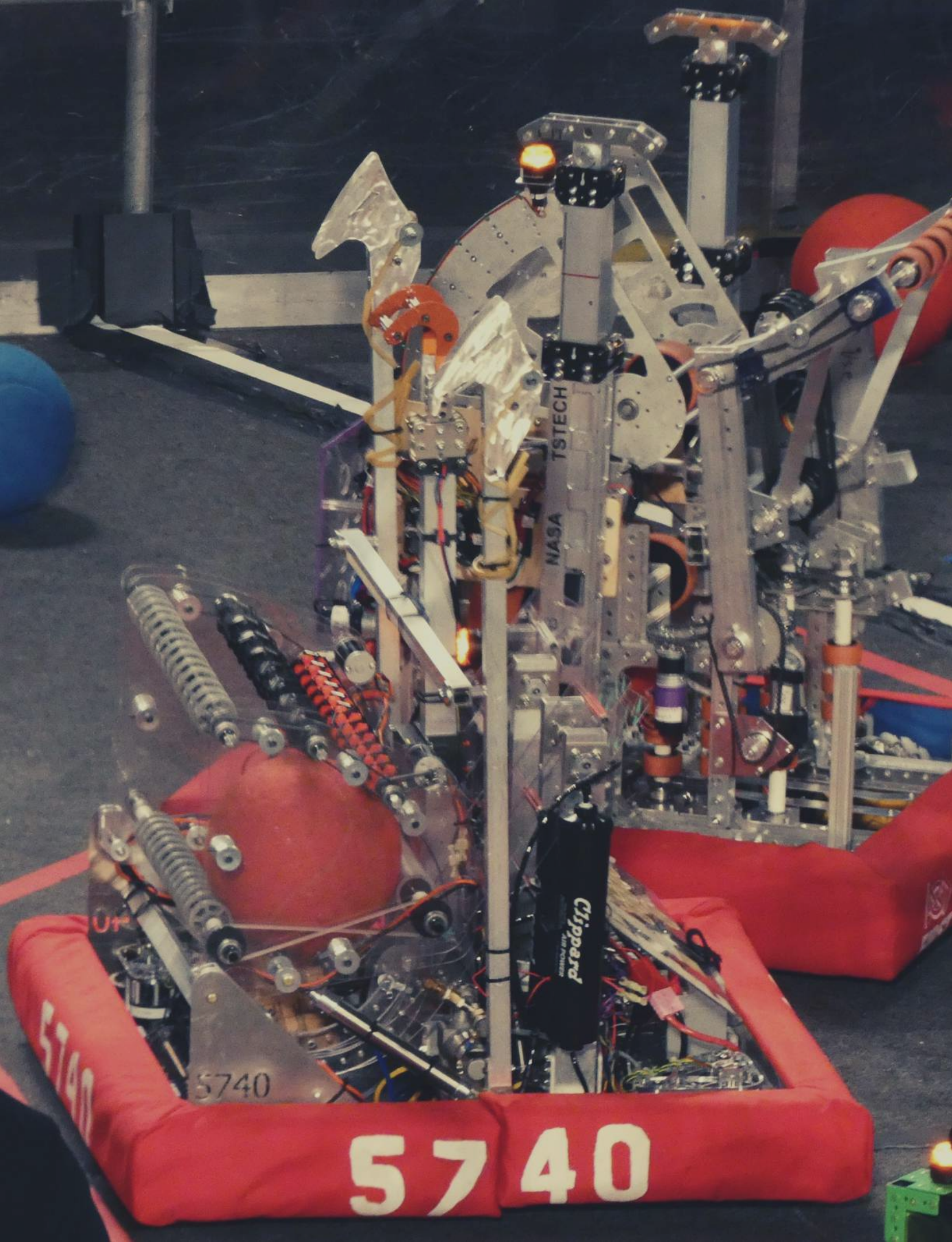


FRC BOOTCAMP

We have invited local FLL teams and students interested in STEM to visit our warehouse for FRC Bootcamp.



Students help us manufacture our parts on their first day of camp. They return a week later to see the finished robot and receive a 5740 t-shirt. Then they return for a third visit to drive the robot!



NASA TSTECH

Clippard
Air Power

5740

5740

The background features a diagonal split between a bright yellow upper-left section and a vibrant pink lower-right section. A thick black diagonal band runs from the top-left towards the bottom-right. The text 'FIRST EXPANSION' is written across this band in a bold, sans-serif font. 'FIRST' is in pink and 'EXPANSION' is in yellow. In the background, there are several 3D-style geometric shapes: a purple square with a white outline, a pink circle, and a yellow triangle. The word 'FIR' is partially visible in large, bold, yellow letters on the yellow background.

FIRST EXPANSION

FLL: PATHWAYS TO INSPIRATION

**120+
students**



**10 FLL
Teams**

We brought FLL to our local grade school, St. Kilian. We hosted FLL training days in the fall and spring so the kids could experience FIRST and FLL, which then evolved into a full program. We also went to St. James and worked with their FLL Teams on assisting them with their mechanisms.



We wrote grants with FRC 599 to create 10 FLL teams in Grenada Hills, California based on our FLL model.

FLL: PATHWAYS TO INSPIRATION

We ran an FLL Tournament called the Terrific Trojanator Tournament in 2018 and 2021. We provided design tips and assistance to the teams.



25 Teams



FTC: FAR AND WIDE

4 Programs

FTC Trojanators 12578
Aquinas Academy 14427 - Gibsonia, PA
Bison Tech 14444 - Erie, PA
ACE Robotics 15430 - Desert Mountain, AZ

1

Inspire Award



1

Event Win

We have provided technical and non-technical aspects to these teams!

2 Workshops
for 5 FTC
teams

We helped these teams to learn all about the basics of FTC and provided design, strategy, and game play tasks for a successful competition.

FTC: FAR AND WIDE

We collaborated with FRC Team 6314 to create FTC Team 15430 using our FTC Class structure.

"5740 is a model team for us. They answer questions and assist us with sustaining our team in the long run!" (Jake Okun, FTC 15430).



5740 ran the only kick-off in Western PA in 2018. Our FTC efforts evolved to an official scrimmage hosted in 2019 where 16 teams attended and competed with 300+ visitors.

FTC: FAR AND WIDE

5740 hosted the Western PA Qualifier in 2023. Several members of the team volunteered as referees and score trackers as well as helping with set-up for the event.



In total, 22 teams attended the event, including our own team 12578. 300+ people were involved in this event.

FRC: INNOVATION IN COMMUNICATION

5740 created and continually moderates the FRC WOW Discord for teams from around Western Pennsylvania, Ohio, and West Virginia. The server promotes collaboration and communication amongst teams, and helps friendships form between different team members.

275+
Members

66
Teams



5740 utilizes our team members' unique talents and skill sets through our WOW-Region Podcast, Inside FIRST. Podcast episodes are uploaded to YouTube. The podcasts are 100% student-run and discuss everything FIRST from a student's perspective.




FIRST

Pennsylvania
Advocacy
Conference of
Technology






A graphic design featuring a diagonal black banner with a yellow border. The banner contains the text 'POLITICAL ADVOCACY' in a bold, sans-serif font. The word 'POLITICAL' is in red, and 'ADVOCACY' is in yellow. The banner is set against a background of a red upper half and a yellow lower half, separated by a diagonal line. In the center, there is a stylized graphic of a blue and white structure, possibly representing a building or a logo, with the letters 'P' and 'T' visible in white on a blue background.

POLITICAL ADVOCACY

PACT Legacy

Founded by 5740, The Pennsylvania Advocacy Conference of Technology (PACT) advocated to legislators for increased STEM education funding and the promotion of after-school STEM programs within our state, with specific focus on the PASMART funding bill.

Before our efforts, Pennsylvania was ranked #48 in STEM education. We met with state representatives, with the goal of persuading them to advocate for STEM funding at the state level. Pennsylvania now ranks #2 in the country with \$30 million from PASMART.

At the 2019 Greater Pittsburgh Regional, we hosted a PACT informational meeting for teams to attend. Alongside our regional director, Daphne Frownfelter, we discussed the meaning of PACT, PASMART, and the importance of Advocacy.

765

Schools have benefited from PASMART



PACT Legacy

In late fall of 2019, the state added \$10 million to the PASMART grant pool and loosened restrictions on how to spend the money!

There has been great progress and success since the passing of PASMART - The Philadelphia Robotics Coalition received \$150,000 to create 200 FLL Teams!

Examples of Targeted Grants:

Bradford Area School District received \$35,000 for expanding computer science programs, focusing on the elementary school level.

Seneca Valley received \$35,000 to expand their FTC robotics, coding, and AI programs.

State Advocacy Summit:

In February of 2020 5740 presented with 6 other FRC teams through FIRST Updates Now. This broadcast allowed us to present how we effectively advocate and how others can begin advocating in their own states.

SASA-NAC

Several of our students went to the 2022 National Advocacy Conference (NAC) held in Washington, D.C. to advocate for the expansion of STEM opportunities at the local, state, and federal level. Through the Student Association for STEM Advocacy (SASA), our students were able to form important relationships with Representatives and Senators while doing something they love: encouraging accessible STEM programs for all!



TRETC CONFERENCE

In October 2019, we presented PASMART and PACT at The Three Rivers Educational and Technology Conference, as part of a student showcase. We spoke with administrators and educators about FIRST, demoed our robot, and explained the PASMART Bill and its use for FIRST and STEM education.



We presented at TREC again in 2022 and 2023, about making connections with industry professionals. We used our team as a case study to show “How many connections it takes to build a student.” We advocated for programming within schools to follow FIRST’s model for mentorship. We characterized connections as Touch-point Partnerships, Meaningful Mentorship, & Authentic Apprenticeship.

5740 IS...



Above is a word cloud, where students were asked to describe Team 5740 and their experience with FIRST in one word.







And a Special Thanks to All Our Mentors!



THANK YOU!

THANK YOU **North Catholic High School** for supporting our Mission.

Mentors and Parents, THANK YOU for contributing your time, knowledge, and expertise. We appreciate all that you do!

THANK YOU to our **Sponsors!** We appreciate your generous donations and in-kind contributions, which allow us to build a robot and operationalize our team.



The image features a central graphic of a gear with a human-like face inside it. The gear is yellow with a red outline, and the face is red with a yellow outline. The entire graphic is set against a solid red background. A horizontal yellow band runs across the middle of the image, containing the text "FOREVER TRUE" in a bold, italicized, yellow font. The text is centered within the yellow band and is partially overlaid by the gear graphic.

FOREVER TRUE