

The logo is a stylized gear with a Trojan horse inside it. The gear is yellow with a red outline. The Trojan horse is red with a yellow outline. The background is a solid red color. Two horizontal yellow lines cross the logo.

# TROJANATORS 5740

2024





Dedicated to Woodie Flowers

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"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.

**FRC TEAM 5740  
TROJANATORS 2024  
NON-TECHNICAL BOOKLET**

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# 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."*

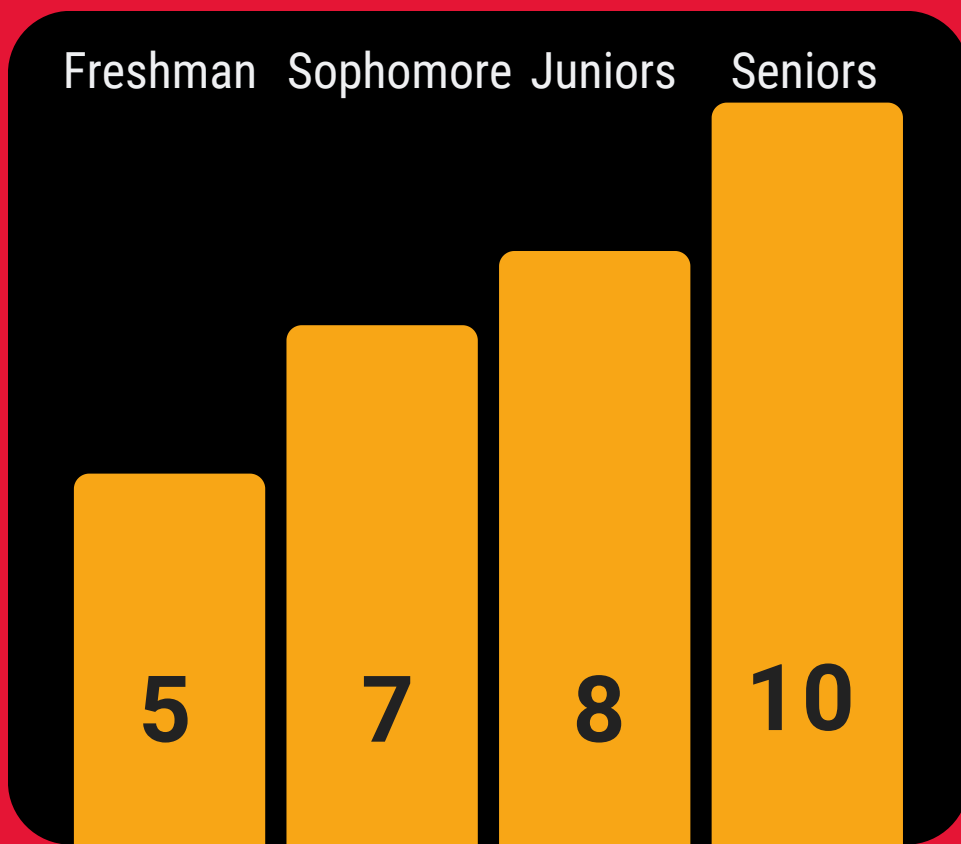
## TEAM VALUES:

Teamwork  
Commitment  
Celebrating Success



# 5740 BY THE NUMBERS

Teams we started and/or mentored:



**28**  
students

**12**  
mentors

**100%**  
of outreach is student executed.

# TEAM AWARDS

————— 2015 —————

Rookie Inspiration Award

————— 2016 —————

Verizon App Challenge

————— 2017 —————

Dean's List Finalist

# TEAM AWARDS

————— 2018 —————

Engineering Inspiration  
\$100,000 Kahn Family  
Foundation Grant

————— 2019 —————

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

————— 2020 —————

Chairman's Award

# TEAM AWARDS

———— **2021** ————

Dean's List Finalist  
Chairman's Award

———— **2022** ————

Dean's List Finalist  
Woodie Flower's Award Winner

———— **2023** ————

Dean's List Finalist  
Innovation in Control Award

———— **2024** ————

Sustainability Award

# LEADERSHIP STRUCTURE

## LEAD MENTORS



**David Yackuboskey**



**Matt Schwabenbauer**

## STUDENT LEADS



**MECHANICAL**  
**Milan DeNicola**



**CONTROL**  
**SYSTEMS**  
**Bridget Culley**



**BUSINESS**  
**ADMINISTRATIONS**  
**Sophia Signoriello**

# TITLE SPONSOR

**PENNA FLAME**

Established 1968

We would like to thank our generous 2024  
Title Sponsor: Penna Flame Industries



This is our second year partnering with Penna Flame. We've toured their facility and keep in constant communication for any future tours and events. A connection through the team is even acting as an ambassador with the company for robotics specific events.

# **CORPORATE SPONSORS**

## **Title**

**ARMSTRONG**

## **Gold**

**JEREMIAH BONDRA DMD, PC  
HERTWOOD DENTAL ASSOCIATES  
PFIZER**

## **Scarlet**

**MITSUBISHI ELECTRIC POWER PRODUCTS INC.  
DPL ENGINEERING LLC  
RAILWORKS  
BD MATCHING GRANT  
AOH DIVISION 32**

## **Friends**

**JOSEPH J. BRUNNER, INC.  
THE FACE LAB  
SCHELL GAMES  
EDWARD JONES  
LIGHTSPEED CONSULTING  
FUN FORE ALL**

# FAMILY SPONSORS

## Title

BOBBIE & WILLIAM PETERSON

## Scarlet

ANONYMOUS  
SIGNORIELLO FAMILY

## Friends

RAYMOND A. & JENNIFER RAPKO  
SOPHIA'S GRANDPARENTS



# 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. We also invite them in for workshop tours.

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 51 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) was involved with research. After several internships, he now works at Neuralink.

Thomas Franco (2020) will be joining Dow Chemical as an engineer this summer after working in their Operations division in 2023.

Dalhart Dobbs (2021) is doing research at Johns Hopkins University and interning at Neuralink.

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







Curriculum &  
Career Development

# CURRICULUM IMPACT

**18**  
**STEM**  
**Electives**

**500+**  
**Students**  
**Involved**

- AP Computer Science Principles and A
- Cryptography
- Introduction to Engineering
- STEM Choice
- Introduction to Environmental Science
- Science of Cooking
- Introduction to Electronics
- Honors Intro to CADD
- Skilled Trades Exploration
- Forensics Science
- Medical Perspectives
- FIRST Class Robotics I
- FIRST Class Robotics II
- Into to Computer Science
- Human Anatomy and Physiology I and II
- Astronomy



# 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.



**75+**  
**Students Involved**



# IN-REACH

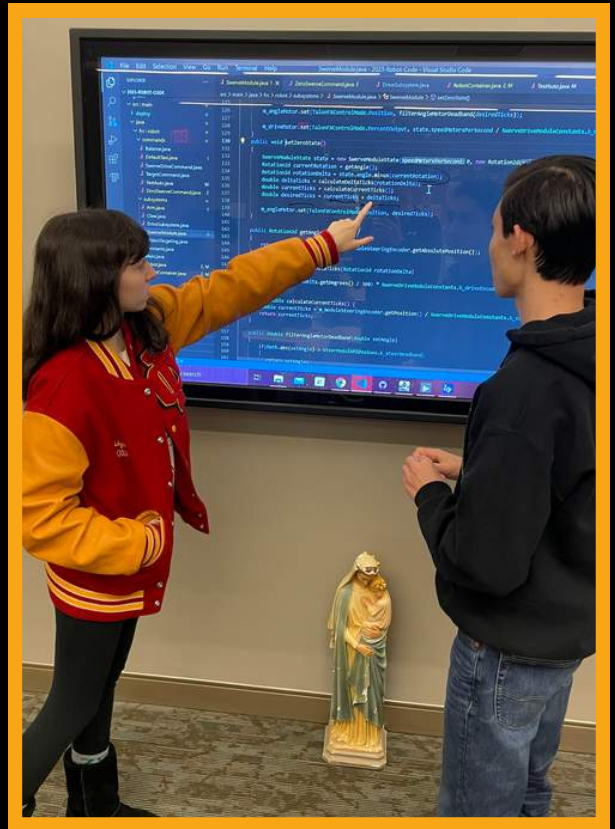
5740 In-reach refines our students' technical and business skills prior to build season. Sessions are taught by our mentors and student leads, held at various times throughout the week to ensure students can participate on various sub-teams. This year, we focused on CAD, Software, Machine, and Business skills. In-reach allows us to work with purpose, to increase efficiency, and to grow the skills of our new team members.

**CAD**





# Software



# Workshop Training



# Business





# ENGINEERING NETWORK

- Personalized pathway for students to explore career interests and develop industry aligned skill sets
- Touch-point partnerships, guest speakers, career-oriented field trips
- 8th and 9th period elective slots stacked to be involved in: the robotics program, independent research and design project, and work-study opportunities
- Robotics: This pipeline will involve taking Intro to Engineering and Electronics, our FTC Class, and involvement in our FRC team as a specific engineering focus.

# 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.

# WOMEN IN 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

# WOMEN IN STEM

5740 leads Bridget (Control Systems) and Sophia (Business Administrations) visited CapSen to learn more about real-world applications of robotics from a local business in Pittsburgh.













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.

# TIKKUN OLAM MAKERS

In the past year, we have been in contact with various representatives of Tikkum Olam Makers (TOM). This non-profit organization is based out of Pittsburgh and works to make adaptive items and toys for medically fragile individuals. Our team has met with them at PRN Discovery Day, TRETTC, and has set up calls outside of these events to discuss sending out the adaptive items we have printed. We have printed three different items on our own 3D-printers in house using TOM's open-soure CAD files.

**70+**

**Prints**



Tikkun Olam Makers







# SENIORS FIRST



6

Senior Community Visits

200+

Residents Reached

5740 shares our FIRST and STEM experiences with the residents. We share our outreach initiatives, demonstrate our robot, talk about FIRST, teach them how to FaceTime loved ones, and present information about cyber security. We make many personal connections with residents through this outreach, including meeting residents who were in STEM fields as young adults and even some with grandchildren involved in other FIRST teams!



"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

**6 YEARS**

**300+ 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:

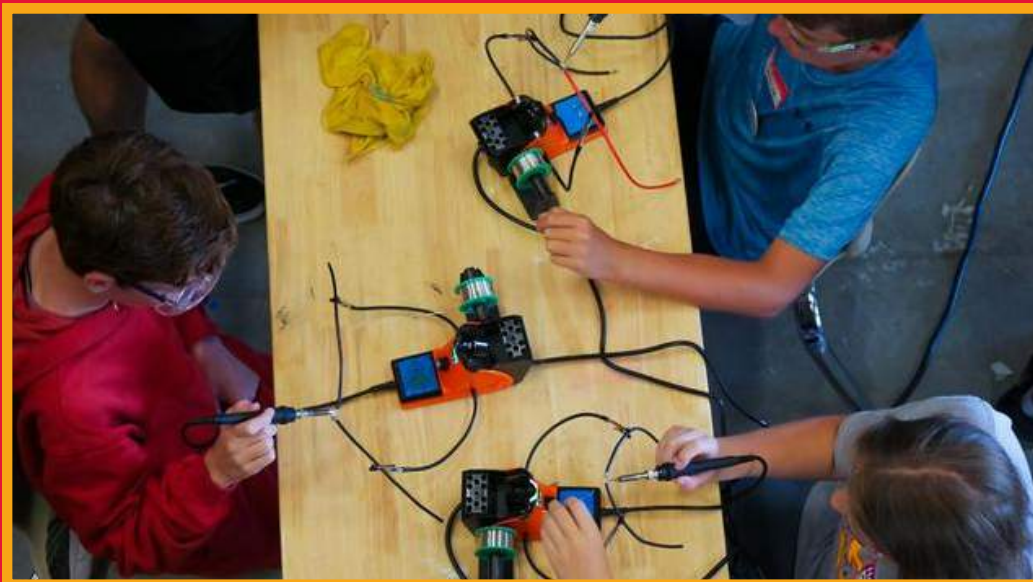
This week was dedicated to 4th through 6th graders. Campers were introduced to CAD, software, and button making. The building aspect reflected FLL, where the campers used Legos to build their attachments.

# STEM CAMPS

## SUMMER AT NORTH CAMP:

Different from past years, the summer camps were held all day with younger kids in the morning and older kids in the afternoon. Rather than doing a split of Lego building and FTC demo as in the past, this year we had all groups use Lego SPIKE kits and go through the lessons with us.

This was to go towards the year's efforts of strating FLL and gaining interest in the community, specifically local middle schools.



# STEM CAMPS

## FLL CAMP:

Our team hosted a FIRST Lego League Camp to gain interest in FLL from middle school kids 4-8th grade. We split up groups to use Lego SPIKE kits, going through the lessons throughout the first day. We had them fill out an engineering notebook throughout the week and built the game mat to do a demo competition between teams at the end of the camp. Campers then gained skills with design, build, and code, as well as learning the values of FIRST.









# 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.

Over the summer we went again to host a day of fun robotics activities! We made various robotics crafts, had other interactive robotics activities, let the kids play with LEGO Duplo's, read FRC team books, and demonstrated our robot.





# 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 Mars New Year and helped to host the robotics portion. The town of Mars celebrates the planet Mars' new year with science and alien activities. FLL, FTC, FRC, and VEX 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

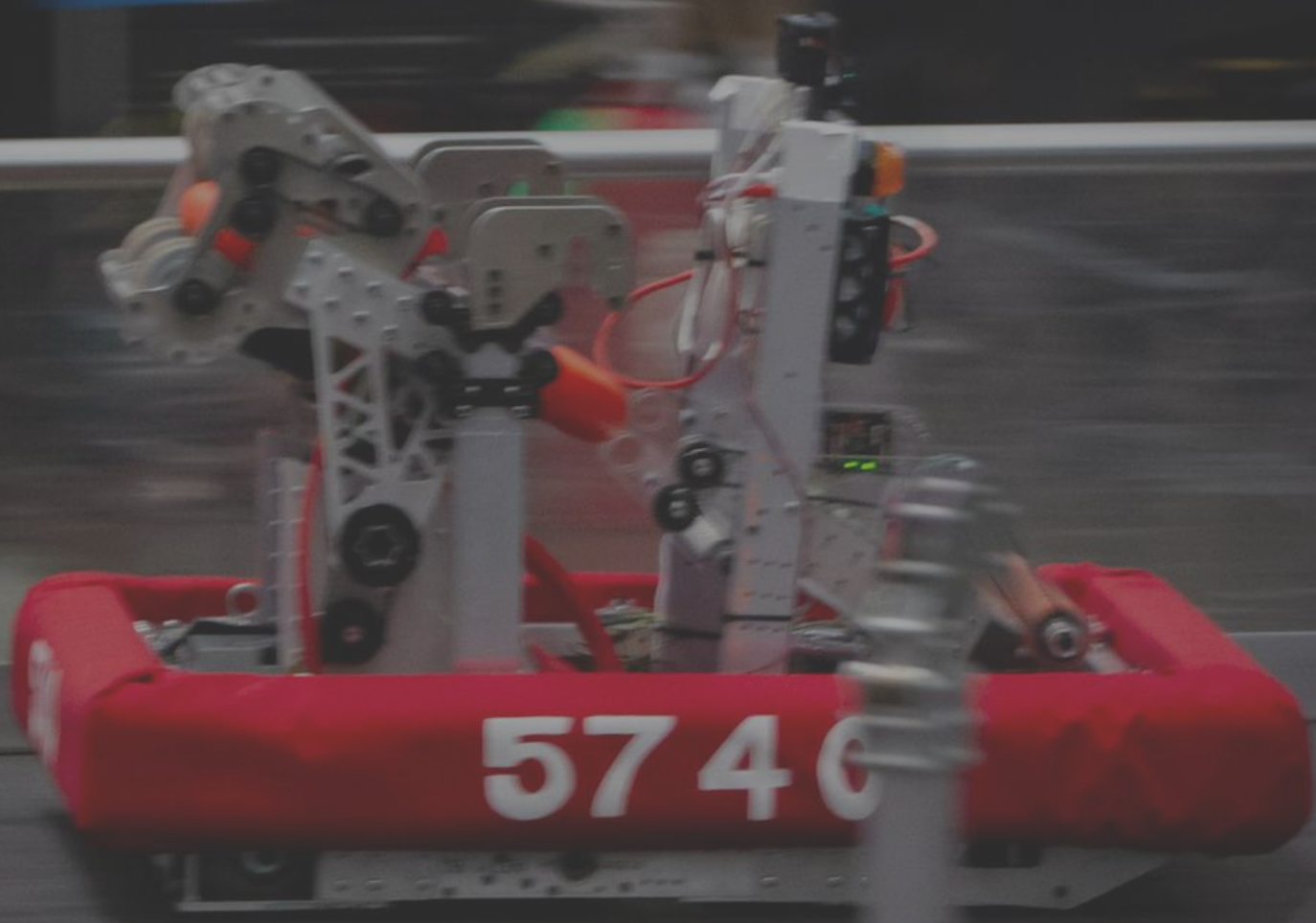
## Girl Scouts:

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.





5740





FIRST EXPANSION

# FLL: PATHWAYS TO INSPIRATION

**10 Previous FLL  
Teams**

**3 New Teams  
Started**

We are bringing FLL to our local feeder school, St. Kilian, and other local middle schools, like St. James. We hosted two FLL summer camps, an FLL interest meeting, and have a mentoring schedule posted and set for throughout Spring up to their competition season.



# 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

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.



5740 hosted the Pittsburgh area FTC kickoff for the 2024 season at North Catholic High School. \_\_

teams in the area attended, and we collaborated with MARS Association for hosting! There was even a field set up for teams to see in person and ask question about right after the video was played for teams attending.



# FRC: ALLIANCES

5740 is involved in four alliances, one which our team started, FaithFIRST!



A local robotics alliance for Steel City Robotics Teams.



A robotics alliance promoting Women in STEM and overall inclusion.



A robotics alliance promoting student education and leadership in FIRST.



A robotics alliance promoting inclusion for faith-based FIRST teams.



  
**FIRST**

Pennsylvania  
Advocacy  
Conference of  
Technology



A graphic design featuring a diagonal banner with the text 'POLITICAL ADVOCACY'. The banner is black with a yellow border and a red border. The background is split into a red upper half and a yellow lower half. In the center, there are blue and purple geometric shapes, including a large white letter 'A' and a white letter 'T'.

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!



# SASA-NAC

We advocated alongside other FRC teams to increase the funding for the ESSA Title IV

Part A bill by

**\$75 millions**

increasing it to a total of

**\$1.355 billion.**



# 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 TRETC again in 2022, 2023 and 2024, 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. In 2024, we promoted project-based, experiential learning and STEM/FIRST being implemented into the classroom.

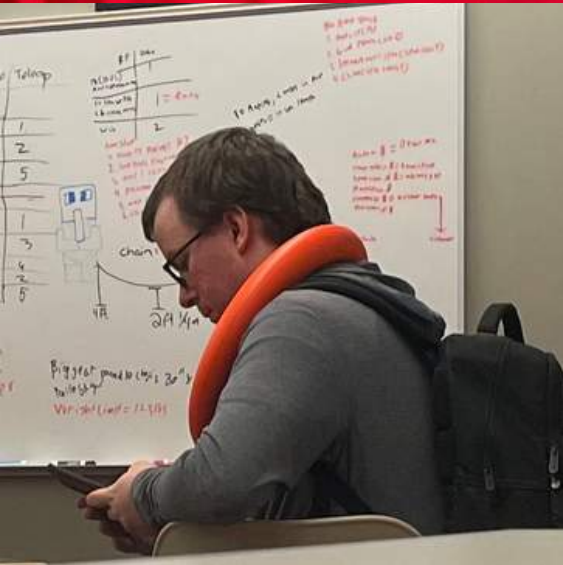


















# And a Special Thanks to All Our Mentors!



# 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.





A stylized graphic featuring 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 red background. A horizontal yellow band runs across the center of the image, containing the text "FOREVER TRUE" in a bold, italicized, yellow font.

***FOREVER TRUE***