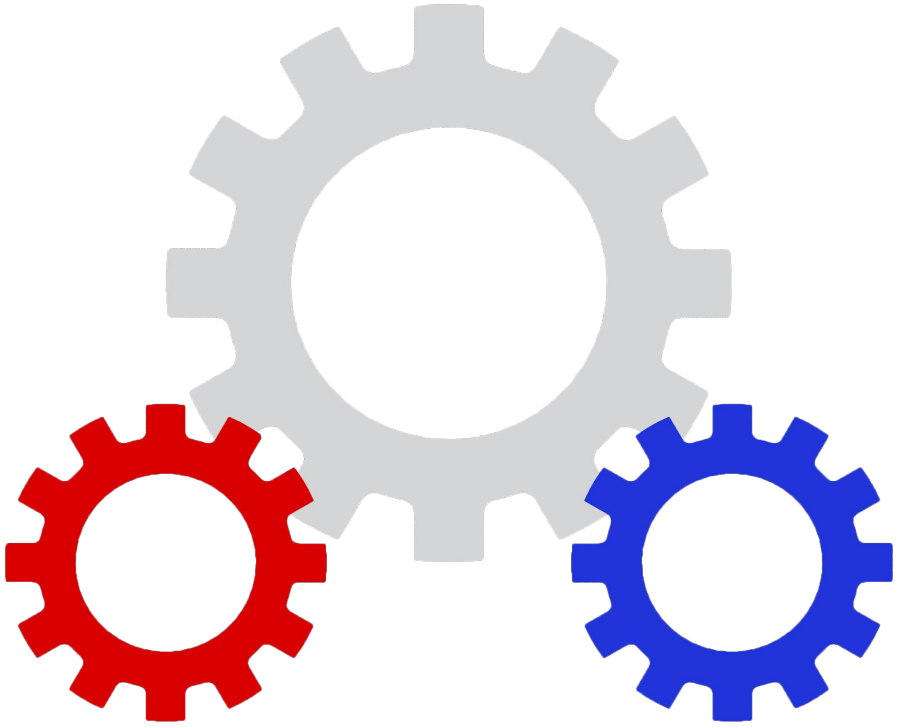
The WorBots 4145

2023 - 2024 Impact Award



Cultivating a Culture of STEM in Worthington, Ohio

ENGAGE, INSPIRE, IMPACT

FRC
FINALIST
FINALIST
FINALIST

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Team Information

Mission Statement

Our mission is to cultivate a culture of STEM in Worthington, Ohio through:

- **Engaging** the community through our STEM and non-STEM outreach
- **Inspiring** future generations of lifelong STEM learners through our constantly improving cohesive K-12 pathway while increasing retention and diversity in STEM fields
- **Impacting** our community through giveback activities and contributing to the workforce with our growing internship programs

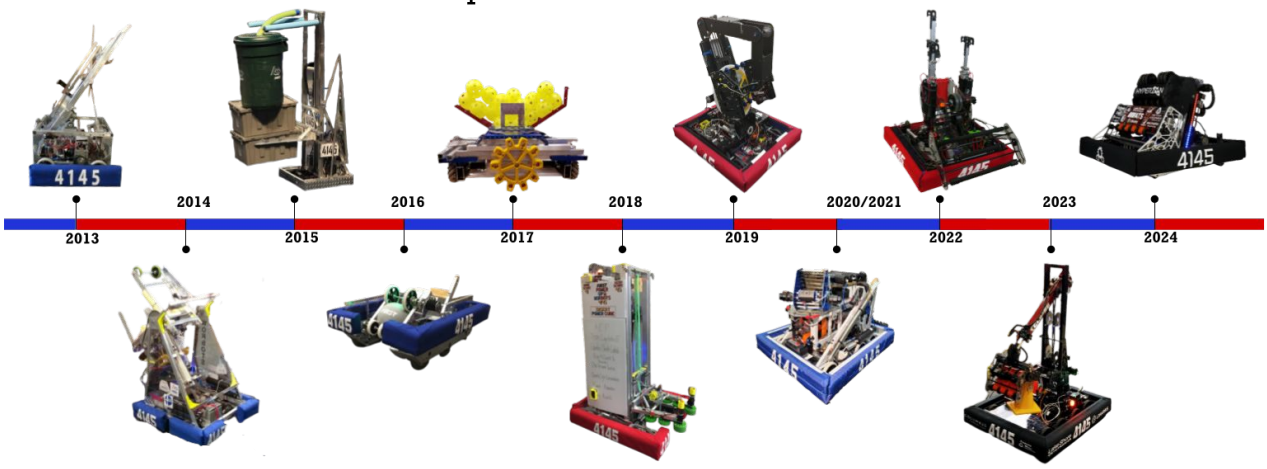
WorBots Core Values

- Innovation
- Education
- Inspiration
- Initiative
- Teamwork
- Professionalism

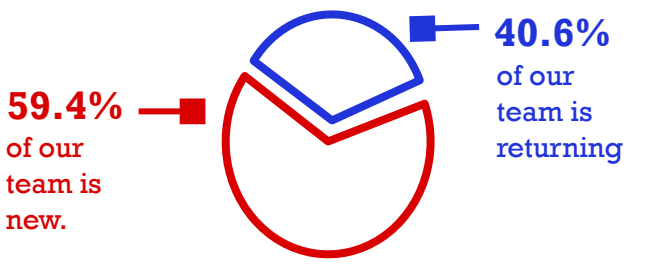
Team Summary

Founded in 2012, the WorBots are dedicated to cultivating a culture of STEM in Worthington, Ohio by engaging, inspiring, and impacting our community. Starting with a single team of less than twenty students and local STEM opportunities limited to the high school level, we set our sights on a *FIRST* pathway inspiring youth and impassioning them about STEM education. We have since developed the Worthington *FIRST* Pathway, including over 100 students across 3 FLL, 1 FTC, and 1 FRC team. We start and fund every Worthington *FIRST* team to ensure students in these schools have a sustainable access point to STEM, and we provide student mentors who serve as role models.

We further share a STEM fervor throughout our small community by connecting youth with STEM hands-on. Through nearly fifty events annually, we allow STEM knowledge, energy, and confidence to flourish. In Worthington, through Columbus Crew Games, local library events, Worthington Market Day, tours, demonstrations, and many other events, STEM and *FIRST* are now ubiquitous. We also focus on using STEM to impact the world around us from printing face shields at the height of the Covid-19 pandemic to annually donating LEGO kits to Nationwide Children's Hospital.



Team Information



- 76% of students are from an underrepresented minority in STEM.
- 77% of our fabrication team is female.
- 50% of our team is female.
- 33% of our team is from an ethnically diverse background

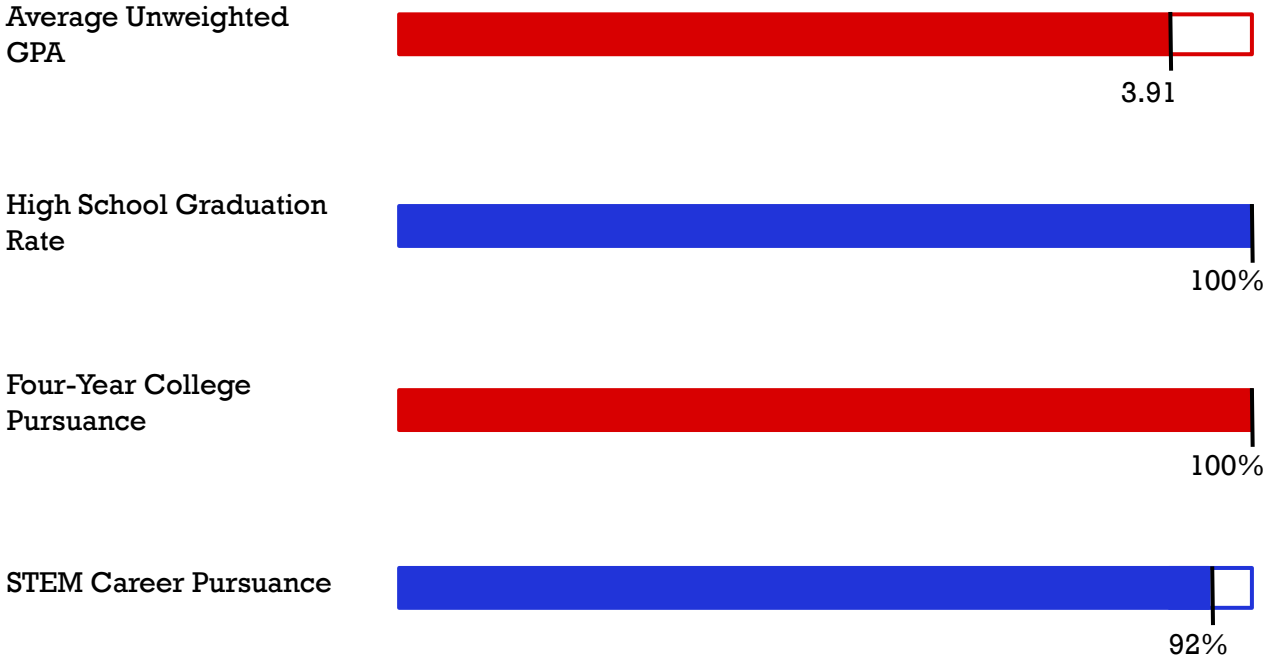
38% of team members were on a feeder team prior to joining.

87% of team members attended an outreach event prior to joining.

75% of our team's student leadership is female.

100% of current team members intend to pursue STEM.

100% of returning WorBots cite *FIRST* as a significant factor in their career goals



Worthington *FIRST* Pathway

For every traditional sport in Worthington, there is a cohesive pathway guiding students through skill development and advanced future opportunities; we are working to build the same for STEM through *FIRST*. We are focused on more than just starting teams. We consistently support every team we develop by providing necessary funding to register and remain competitive throughout the season. We further provide student mentorship to all of our FLL and FTC teams, ensuring that youth are inspired to carry with STEM through the Worthington *FIRST* Pathway and beyond.

***FIRST* LEGO League Team 61943**
Purple Pengtwatoes
Wilson Hill Elementary School

***FIRST* LEGO League Teams 44451 and 44452**
WorHawks and HawkBots
Worthington Hills Elementary School

***FIRST* Tech Challenge Team 16284**
8-Bit Bandits
Kilbourne Middle School

***FIRST* Robotics Competition Team 4145**
WorBots
Thomas Worthington/Worthington Kilbourne High School

WE ENGAGE

Engaging Overview

What does it mean to engage?

For the WorBots, working in our community is about more than the number of people who are seeing STEM—it is about genuine connection between our community and STEM. Engaging events are designed to bridge the gap between Worthington and STEM by providing enjoyable and interactive ways to learn more about STEM. Furthermore, we engage to show people in and beyond our community that STEM and *FIRST* are for all—from introducing local engineering companies to ways to get involved with our team and others to showing school board members and local legislators the impact that STEM has on youth across our community.

How do we engage?

We engage members of our community through community outreach events where we drive robots, provide interactive STEM activities, and share information about the impact of the *FIRST* program. We further engage through events within our schools, where we demonstrate our team, provide information about how to get involved, and show the connections between curricular STEM and STEM education through *FIRST*. We ensure that *FIRST* locally engages all so it can make an impact on everyone.

Our engagement-focused events include:

- Columbus Crew Game Demonstrations
- Worthington Market Day
- Worthington Science Day
- School Board Robot Reveal
- STEM Fairs and Nights
- Elementary School Shop Tours
- Middle School Shop Tours
- Local Business Shop Tours
- Hosting the CORI Invitational
- Community Robot Reveals
- Care After School (CAS) Demonstrations
- Eagle Expert Extravaganza
- Worthington Kilbourne Football Games
- Pep Rallies
- High School Orientation Demonstrations
- High School Activities Fair Demonstrations
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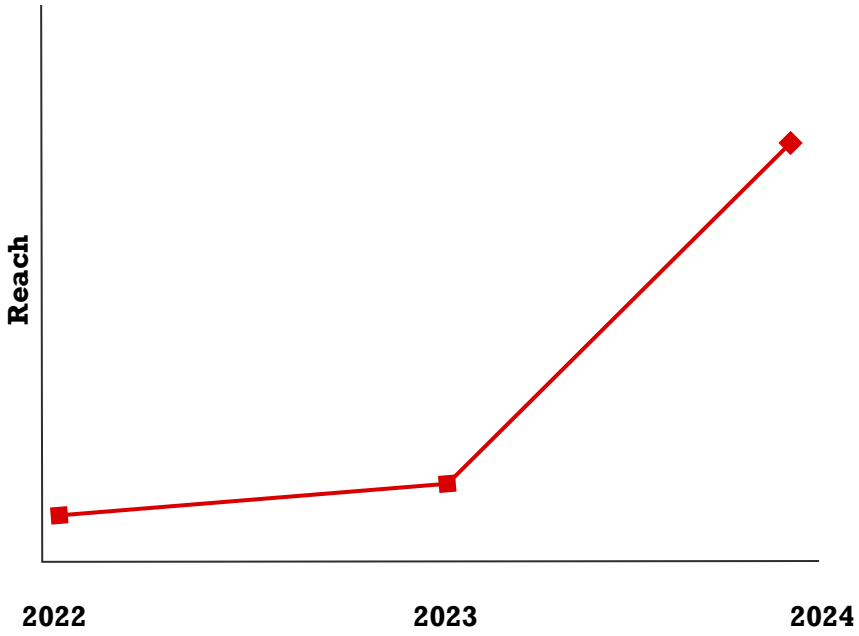
- Local News Appearances
- Introduction to Engineering and Design Class Presentations
- Principles of Engineering Class Presentations
- CAD Class Presentations
- AP Computer Science A Class Presentations

Engaging Overview



200,000+
people reached directly through community outreach initiatives in 3 years.

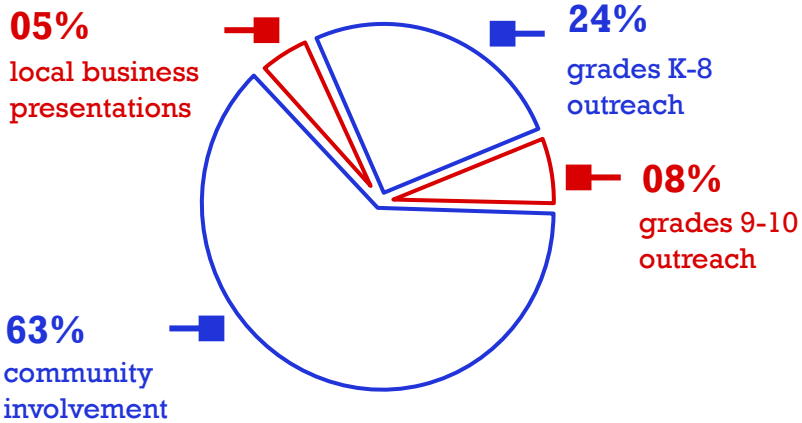
128
community and global outreach events in 3 years.

100+
students currently in the Worthington *FIRST* pathway

60
community outreach events between the 2023 post-season and now.

23
Worthington schools administrators engaged with *FIRST*

05
Worthington *FIRST* teams including 4145 directly started, funded, and mentored.



Columbus Crew Game Demonstration

Purpose

To provide information about the *FIRST* community to residents of Columbus, Ohio and connect individuals with STEM opportunities through *FIRST* that they may be otherwise unaware of.

Event Description

Alongside FC Bank, we ran a booth where we drove our 2023 robot, Eclipse, played "catch" with cubes from the 2023 season to engage young kids with robotics. We also spoke with families from districts across Ohio—connecting them with STEM and *FIRST* programs at their school. We also handed out informational papers and pamphlets to connect people across Central Ohio with STEM through *FIRST*—allowing us to connect with a mentor and local engineers interested in getting involved with *FIRST* in Northern Ohio. We also spoke to Paul LaRue, the President and Member-at-Large of the Ohio State Board of Education, where we shared the impact of the *FIRST* program on STEM education for students across Ohio.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Ohio as a whole" through working to "run or participate in events reaching a broader audience within Ohio expanding beyond Worthington," one of our indicators of success for this long-term goal.

20,000+

people engaged in STEM interactively and through demonstrations of our robot, Eclipse.

42

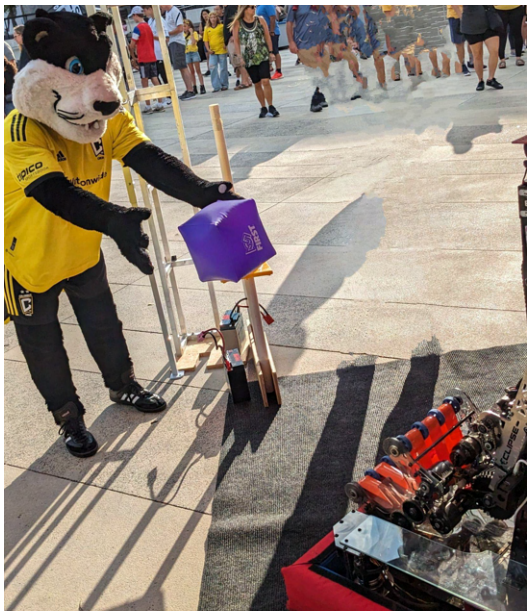
families with whom we discussed getting involved in *FIRST* regardless of kids' ages or school districts.

7

school districts we directed interested families and students to robotics programs in.

3

leaders with whom we discussed STEM education and *FIRST*



Worthington Market Day Demonstration

Purpose

To connect the Worthington community with all levels of the *FIRST* program, demonstrate the impact of *FIRST* on students' STEM learning across the Worthington City School District, and provide information as to how people can get involved.

Event Description

Worthington Market Day is the largest single-day event in Worthington, Ohio, bringing together over 100,000 people. Alongside one of our sponsors, FC Bank, we ran a booth to provide information about the Worthington FIRST Pathway—FLL, FTC, and FRC. We also drove our demonstration robot, Basher, exciting kids about STEM education and causing many adults to say they wish they had programs like ours when they were in high school. We also shared the impact of STEM education on youth within our community and discussed the role of mentors with members of our community interested in getting involved.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally" one of our indicators of success for this long-term goal.

5,000

people engaged in STEM through robot demonstrations, conversations about STEM, and informational materials.

14

students joining the WorBots in 2022 and 2023 citing this event as a way they found our about our team.

8

students connected with FIRST LEGO League and FIRST Tech Challenge teams they went on to join

1

new mentor acquired.

Worthington Science Day

Purpose

To connect the Worthington community as well as students interested in STEM innovation with expansive STEM education opportunities through every level of the Worthington *FIRST* pathway.

Event Description

In the main section of the Worthington Science Day, we ran an informational booth and drove our seasonal robot while playing match videos from each season we have competed in. We provided information regarding how students and families can get involved in the Worthington *FIRST* Pathway regardless of age, grade level, or previous experience. We also provided information to science-focused community members interested in getting involved with our team. Further, we ran mini design challenges throughout the day to engage kids and their creativity with real-world problem-solving applications.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally" one of our indicators of success for this long-term goal.

1,500

people reached through interactive STEM education opportunities and informational materials.

18

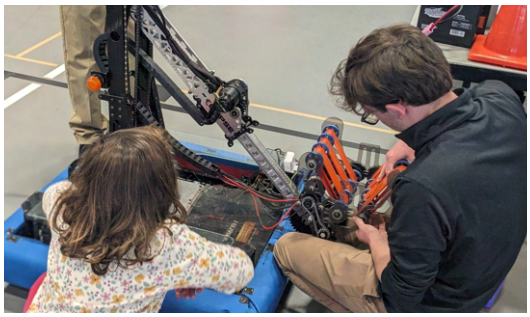
students citing as a reason they learned about the WorBots and decided to join the Worthington *FIRST* Pathway

6

Worthington City Schools administrators connected with further insight on Worthington *FIRST*

1

new mentor acquired.



Worthington School Board Robot Reveal

Purpose

To highlight the value of student learning through *FIRST* and preserve the Worthington Kilbourne High School shop space, expand Thomas Worthington High School STEM spaces, gain support for feeder programs, and advocate for *FIRST* in Worthington.

Event Description

We annually invite out school district into our workshop to hear a presentation from our team on the value of student learning through the *FIRST* program. Here, we show the progress f our feeder teams as well as our team and discuss the growth of Worthington STEM over the course of the year. We also highlight the need for STEM support in Worthington, especially as both of our high schools. Thomas Worthington High School and Worthington Kilbourne High School, are remodeled. We also focus on events such as Worthington Science Day and expanding STEM opportunities through these events.

Through this event, we worked towards our long-term goal to "expand the presence of FIRST within Worthington and Worthington Schools" through working to "have 5 members of the Worthington City School Board in our shop annually" one of our indicators of success for this long-term goal.

$10,000

in additional STEM funding gained directly through advocacy with the school district

16

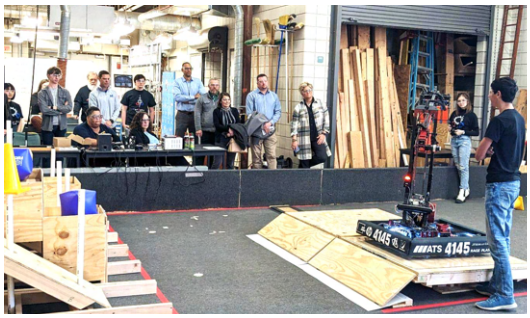
Worthington administrators directly connected with *FIRST* in Worthington City Schools.

2

school buildings with significantly expanding STEM education workspaces for interactive learning.

3

subsequent meetings with district leaders to grow Worthington STEM



STEM Fairs and Nights

Purpose

To reach community members, district leaders, and students interested in STEM education and teach them about the *FIRST* program and the variety of opportunities available through it.

Event Description

We regularly demonstrate our robot for the season and create interactive opportunities for kids to learn about how the robot works—playing catch, testing the autotargetting with the limelight and reflective tape, or trying to pull the mechanisms that the robots are able to move to see the strength of the gear ratios—in our workshop or at local STEM fairs. We also demonstrate our climbing element for the season whenever possible. Further, we provide informational materials to get people interested in STEM involved with *FIRST* as students in the Worthington *FIRST* Pathway or mentors.

Through this event, we worked towards our long-term goal to "expand the presence of FIRST within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally." one of our indicators of success for this long-term goal.

700

people engaged with interactive STEM education activities, robotics, and information about *FIRST*.

85%

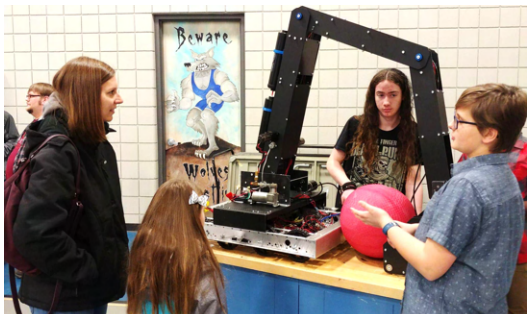
of students from one STEM night, Kilbourne Middle School STEM Night, went on to join FTC 16284.

6

students connected with the *FIRST* Robotics Competition level of the Worthington *FIRST* Pathway.

1

FIRST Tech Challenge team started as a direct result of one of these events.



Elementary School Shop Tours

Purpose

To encourage elementary school students to get involved with STEM starting at an early age through interactive opportunities to learn more about the different components of *FIRST*.

Event Description

We regularly host elementary school students from across Worthington City Schools in our workshop. Here, students are able to learn more about STEM through driving a robot as they learn about all the processes that make it move, seeing a demonstration of our robot for the season, completing a design challenge in teams, and learning about what it means to run a business and be a leader. We also discuss what *FIRST* looks like at all levels of the pathway—*FIRST* LEGO League through *FIRST* Robotics Competition—and how students can get involved regardless of prior experience or if their school has a feeder team.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

1,000

kids engaged with interactive STEM activities through shop tours in three seasons.

113

students attending other events hosted or run by the WorBots due to their involvement with these events.

65%

of event attendees (or parents/guardians) request more information about how to get involved with the *FIRST* pathway.

14

students connected with the Worthington *FIRST* Pathway through FLL or FTC.

Middle School Shop Tours

Purpose

To encourage middle school students to get involved with STEM education starting at an early age through interactive opportunities to learn more about the different components of *FIRST*.

Event Description

We regularly host middle school students from across Worthington City Schools in our workshop. Here, students are able to learn more about STEM through driving a robot as they learn about all the processes that make it move, seeing a demonstration of our robot for the season, completing a design challenge in teams, and learning about what it means to run a business and be a leader. We also discuss what *FIRST* looks like at all levels of the pathway—*FIRST* LEGO League through *FIRST* Robotics Competition—and how students can get involved regardless of prior experience or if their school has a feeder team.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

600

kids engaged with interactive STEM activities through shop tours in three seasons.

97

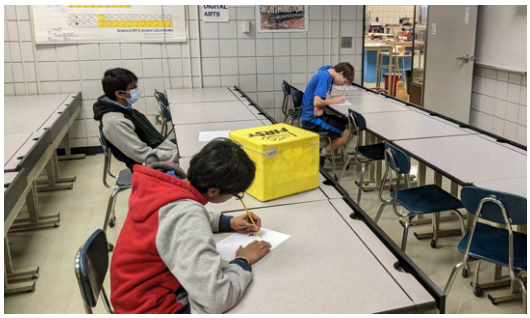
students attending other events hosted or run by the WorBots due to their involvement with these events.

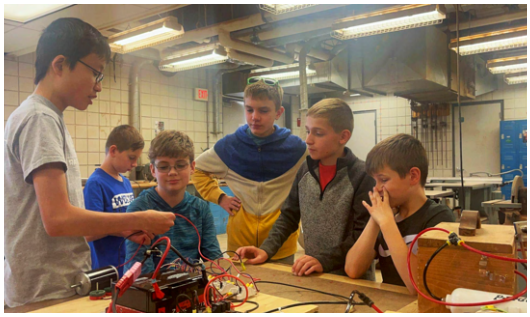
72%

of event attendees (or parents/guardians) request more information about how to get involved with the *FIRST* pathway.

16

students connected with the Worthington *FIRST* Pathway through FLL or FTC,





Local Business Shop Tours

Purpose

To engage local businesses with the impact that *FIRST* programs across Worthington are having on students to forge connections with professionals who can share their industry experience and connect STEM and business-focused students with career opportunities.

Event Description

We regularly host representatives of local businesses in our workshop, where we drive a robot and discuss the various components and processes that bring it together. We also talk about the impact of student learning and hear about how the skills we are developing in *FIRST* connect to industries like the company touring based on their experience. We then give a presentation on our team and operations and learn about emulating professional business or technical operations to strengthen student learning. Further, we talk to attendees about how they can get involved with *FIRST*—regardless of the field they're in.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

75

representatives of businesses in and beyond Worthington connected with the *FIRST* program

19

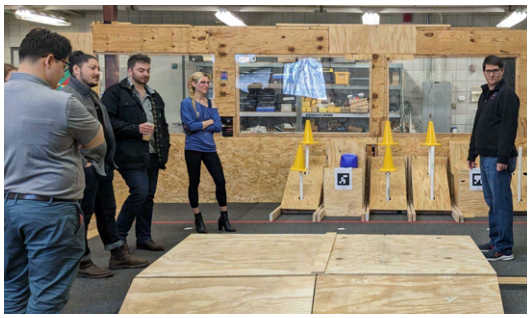
different local companies engaged with Central Ohio *FIRST* programs such as ours.

7

consultants (mentors with less of a time commitment) acquired to support the WorBots.

2

mentors recruited for other *FIRST* teams in Central Ohio



Hosting the CORI Invitational

Purpose

To connect with *FIRST* Robotics teams across the Midwest through low-stakes matches and show the Worthington community what *FIRST* is—providing an in-action view of student learning.

Event Description

Each season the CORI Invitational operates, we host the event in conjunction with the PAST Foundations. Teams compete in our auxiliary gym and we run the pits in our main gym, then we open up the machine shop in our workshop as needed to ensure teams have everything they need to succeed. We invite feeder team students, district leaders, and interested community members to this event to see *FIRST* in action, providing a more realistic view of what the WorBots are doing and exciting members of our community about the Worthington *FIRST* Pathway.

Through this event, we worked towards our long-term goal to "expand the presence of FIRST within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally," one of our indicators of success for this long-term goal.

1,500

people reached each season through viewing teams from across the Midwest and Central Ohio compete.

25

teams hosted each year to compete and work together to promote and grow *FIRST* in the Midwest

14

Worthington City Schools administrators reached as they view learning through STEM and *FIRST* in action.

5

students connected with the Worthington *FIRST* Pathway.

Community Robot Reveals

Purpose

To engage community members with the impact of STEM education through *FIRST* and the magnitude of student's learning from the *FIRST* program as well as the impact our students are making even beyond the robot.

Event Description

Each year, we host members of our community in our workshop to see our new robot for the season. We show attendees the game for the season then highlight all the capabilities of our robot, how the subcomponents creating them were designs, and the mechanisms that allow the robot to operate. We also discuss the Worthington *FIRST* Pathway and how student learning is a culmination of experiences starting in elementary school and extending beyond high school—providing information to community members as to how they can get involved with the *FIRST* program.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

100

people reached annually through interactive demonstrations of our new robot for the season.

59%

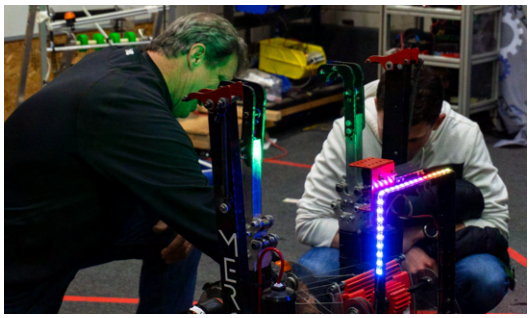
of event attendees requested more information about getting involved with Ohio *FIRST*

12

community organizations, initiatives, and companies represented by event attendees

3

mentors recruited to get involved with the Worthington FIRST Pathway.



Care After School (CAS) Demonstrations

Purpose

To connect Worthington elementary school students at schools without feeder teams with interactive STEM education activities outside of the classroom to engage them in STEM learning and excite them about the *FIRST* Pathway.

Event Description

We bring our season's robot to after school programs at schools without feeder teams yet and drive it—demonstrating its capabilities for the season. We also get kids involved in these demonstrations through having them co-drive the robot with our primary driver, hold reflective tape and move it around to see how the robot will react, and placing game elements to challenge the robot to intake. We also share information about *FIRST* and how students can get involved with the *FIRST* program through *FIRST* LEGO League teams in other elementary schools with the district.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

200

elementary school students directly reached with interactive STEM education opportunities and information.

35

students attended another interactive STEM education event hosted or run by the WorBots

17

families connected with further information the Worthington *FIRST* Pathway.

4

students joined the Worthington *FIRST* Pathway.

Eagle Expert Extravaganza

Purpose

To connect students at Evening Street Elementary School with STEM activities despite the current lack of feeder team available to students at the school through interactive introductions to the engineering and design process.

Event Description

We ran a series of interactive engineering and design workshops in which we first presented what the engineering and design process is and then posed a challenge to students. From there, they initially worked on designing a robot to address the components of the challenge that we posed. After ten minutes, we began to walk around and encourage students to think through their robot design and potential restrictions associated with it. Then, we encouraged students to stand up and present their robot designs and how they addressed the specific challenges posed in order to encourage public speaking and confidence in sharing ideas.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

100

elementary school students directly reached with interactive STEM education opportunities and information.

13

students attended another interactive STEM education event hosted or run by the WorBots

6

families connected with further information the Worthington *FIRST* Pathway.

2

students joined the Worthington *FIRST* Pathway.

Worthington Football Game Demonstrations

Purpose

To spread *FIRST* to the entire student body at Worthington Kilbourne High School and Thomas Worthington High School regardless of STEM coursework or knowledge and share the team's accomplishments for the season.

Event Description

We bring our robot to the "WoTown Showdown" an annual football game between Thomas Worthington High School and Worthington Kilbourne High School. These are the rivaling schools in Worthington and the two schools that make up the WorBots. We drive a robot and demonstrate the elements of the game for the season, such as shooting or picking up and placing game elements. When possible, we also highlight the climbing element for the season.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

1,500

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

26

students requested more information about STEM in Worthington as a result of seeing us at the game

15

students who attended a football game we attended joined the WorBots the following season

6

Worthington City Schools administrators reached

High School Pep Rallies

Purpose

To spread *FIRST* to the entire student body at Worthington Kilbourne High School and Thomas Worthington High School regardless of STEM coursework or knowledge and share the team's accomplishments for the season.

Event Description

We bring our seasonal robot to pep rallies at both high schools we represent, Thomas Worthington High School and Worthington Kilbourne High School. We drive the season's robot and demonstrate the elements of the game for the season, such as shooting or picking up and placing game elements. When possible, we also highlight the climbing element for the season. We're also recognized in years that we qualify for the *FIRST* Championship or the Ohio State FRC Championship.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

3,000

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

28

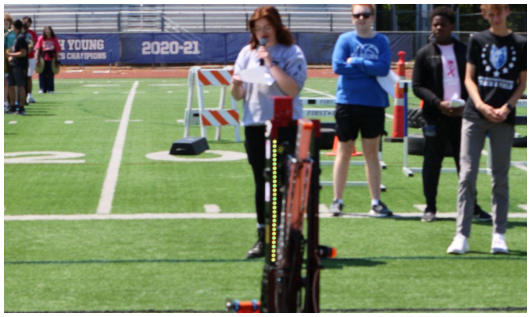
students requested more information about STEM in Worthington as a result of seeing us at the game

19

students who attended a pep rally we attended joined the WorBots the following season

3

Worthington City Schools administrators reached



High School Orientation Demonstrations

Purpose

To connect incoming high school students at Thomas Worthington High School and Worthington Kilbourne High School with STEM education opportunities through the *FIRST* program.

Event Description

We bring our robot from the previous season to orientation events or "Freshmen First Day," where incoming high school students learn more about the programs available to them at the high school level. We drive the robot around the student commons area and demonstrate shooting or pick-and-place abilities depending on the game from the previous season. We also bring components of our climbing element when possible to further highlight our robot's capabilities, and we provide information regarding how students can get involved.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

800

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

103

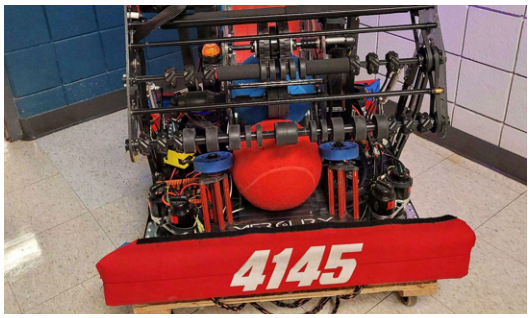
students requested more information about STEM in Worthington as a result of seeing us in action

7

students who saw us during their freshman orientation joined the WorBots for the upcoming season

3

department chairs connected with the Worthington *FIRST* Pathway



High School Activities Fair Demonstrations

Purpose

To connect all interested high school students at Thomas Worthington High School and Worthington Kilbourne High School with STEM education opportunities through the *FIRST* program.

Event Description

We bring our robot from the previous season to activities fairs and involvement fairs where all high school students learn more about the programs available to them outside of the classroom. We drive the robot around the auxiliary gym and demonstrate shooting or pick-and-place abilities depending on the game from the previous season. We also bring components of our climbing element when possible to further highlight our robot's capabilities, and we provide information regarding how students can get involved—no matter their grade level or STEM coursework..

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

1,900

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

37

students requested more information about STEM in Worthington as a result of seeing us in action

9

students who attended an activities fair we attended joined the WorBots the following season

1

club partnership developed in Thomas Worthington High School

High School Curriculum Night Presentations

Purpose

To connect high school students interested in extensions on their STEM knowledge at Thomas Worthington High School and Worthington Kilbourne High School with STEM education opportunities through the *FIRST* program.

Event Description

We bring our robot from the previous season to curriculum night alongside Project Lead the Way teachers where incoming high school students learn more about the classes, clubs, and programs available to them at the high school level. We drive the robot around the event and run and demonstrate shooting or pick-and-place abilities depending on the game from the previous season. We also bring components of our climbing element when possible to further highlight our robot's capabilities, and we provide information regarding how students can get involved.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST*" within Worthington and Worthington Schools" through working to have "five consecutive seasons of equal membership between schools," one of our indicators of success for this long-term goal.

1,300

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

96

students requested more information about STEM in Worthington as a result of seeing us in action

23

students registered for updates throughout the pre-season, season, and postseason.

7

students joined the WorBots after attending this event.

Local News Appearances

Purpose

To share the *FIRST* program with the broader Worthington community and beyond and highlight the operations of our team as well as the impact that Worthington *FIRST* is having on students locally.

Event Description

We are featured in local news articles—highlighting our team, robot, and impact on our community. One of these is ThisWeekWorthington, a subset of the Columbus Dispatch, where they discussed our team, competition season, and what the *FIRST* program looks like in and beyond Worthington. We were also in an article entitled "AEP Helps Robotics Teams Rise," where AEPOhio highlighted their support for *FIRST* teams across the state and talked about our team's impact on the Worthington community as a whole. Further, we are highlighted in Worthington City Schools' news publications.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

25,000

people reached with information regarding our team and the impact we are having on our community

11

unique publications directly highlighting our program and work within the Worthington community.

3

consultants or mentors recruited to support or share their experience with the WorBots.

1

family attended the Buckeye Regional to learn about *FIRST* in action

WORTHINGTON

Worthington Schools students building skills for career and life on Worbots robotics team

Stephen Borgna
ThisWeek

Published 2:20 p.m. ET Jan. 27, 2022 | **Updated 4:02 p.m. ET Jan. 28, 2022**

AEP Helps Robotics Teams Rise

When industrial-sized robots are waging battle, it's wise to steer clear. Though AEP officially remains on the sidelines, through its *FIRST* Robotics grant program, our company is smack in the middle of intense, warring competitors.

No, this isn't BattleBots like you see on TV. But

Introduction to Engineering and Design Class Presentations

Purpose

To connect students interested in STEM and participating in the Project Lead the Way (PLTW) program their freshman year with extracurricular, hands-on STEM education opportunities through *FIRST*.

Event Description

We presented about STEM education opportunities through the *FIRST* Robotics Competition program in every Introduction to Engineering and Design (IED) freshmen PLTW class. We spoke about how knowledge gained in their STEM coursework at school is applied and expanded on within the WorBots, engaging students interested in pursuing careers or post-secondary education in STEM. We also discussed how *FIRST* prepares students for college and career opportunities in STEM beyond what can be developed in a classroom to show the benefit of growing knowledge through *FIRST*.

Through this event, we worked towards our long-term goal to "expand the presence of FIRST within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

160

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

24

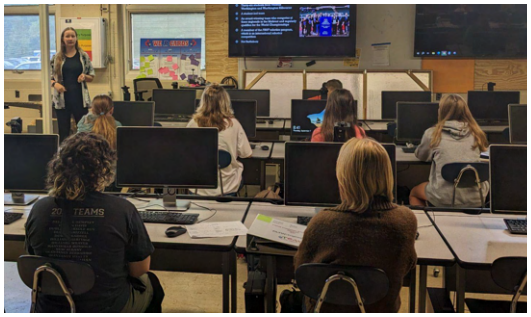
students requested more information about STEM in Worthington as a result of seeing us in action

19

students attended a recruiting event hosted by the WorBots as a direct result of attending this event.

7

students joined the WorBots after attending this event.



Principles of Engineering Class Presentations

Purpose

To connect students interested in STEM and participating in the Project Lead the Way (PLTW) program their sophomore year with extracurricular, hands-on STEM education opportunities through *FIRST*.

Event Description

We presented about STEM education opportunities through the *FIRST* Robotics Competition program in every Principles of Engineering (POE) sophomore PLTW class. We spoke about how knowledge gained in their STEM coursework at school is applied and expanded on within the WorBots, engaging students interested in pursuing careers or post-secondary education in STEM. We also discussed how *FIRST* prepares students for college and career opportunities in STEM beyond what can be developed in a classroom to show the benefit of growing knowledge through *FIRST*.

Through this event, we worked towards our long-term goal to "expand the presence of FIRST within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

120

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

14

students requested more information about STEM in Worthington as a result of seeing us in action

8

students attended a recruiting event hosted by the WorBots as a direct result of attending this event.

3

students joined the WorBots after attending this event.

Computer Aided Design Class Presentations

Purpose

To connect students interested in STEM and participating in STEM-focused elective coursework during their underclassmen years with extracurricular, hands-on STEM education opportunities through *FIRST*.

Event Description

We presented about STEM education opportunities through the *FIRST* Robotics Competition program in every Computer Aided Design (CAD) underclassmen elective PLTW class. We spoke about how knowledge gained in their STEM coursework at school is applied and expanded on within the WorBots, engaging students interested in pursuing careers or post-secondary education in STEM. We also discussed how *FIRST* prepares students for college and career opportunities in STEM beyond what can be developed in a classroom to show the benefit of growing knowledge through *FIRST*.

Through this event, we worked towards our long-term goal to "expand the presence of FIRST within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

40

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

8

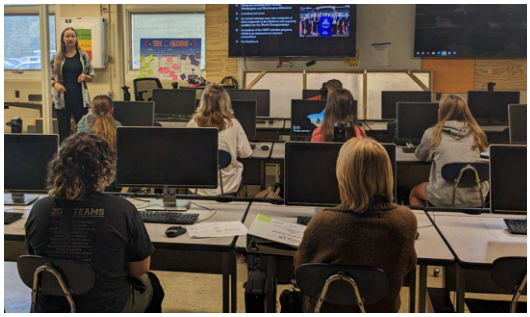
students requested more information about STEM in Worthington as a result of seeing us in action

3

students attended a recruiting event hosted by the WorBots as a direct result of attending this event.

1

students joined the WorBots after attending this event.



AP Computer Science A Class Presentations

Purpose

To connect students interested in STEM and participating in the elective STEM coursework such as Advanced Placement (AP) Computer Science A with extracurricular, hands-on STEM education opportunities through *FIRST*.

Event Description

We presented about STEM education opportunities through the *FIRST* Robotics Competition program in every Advanced Placement (AP) Computer Science A class. We spoke about how knowledge gained in their STEM coursework at school is applied and expanded on within the WorBots, engaging students interested in pursuing careers or post-secondary education in STEM. We also discussed how *FIRST* prepares students for college and career opportunities in STEM beyond what can be developed in a classroom to show the benefit of growing knowledge through *FIRST*.

Through this event, we worked towards our long-term goal to "expand the presence of FIRST within Worthington and Worthington Schools" through working to "run or participate in events at all schools—regardless of feeder team status," one of our indicators of success for this long-term goal.

20

high school students engaged from Thomas Worthington High School and Worthington Kilbourne High School

3

students requested more information about STEM in Worthington as a result of seeing us in action

1

students attended a recruiting event hosted by the WorBots as a direct result of attending this event.

1

students joined the WorBots after attending this event.

WE INSPIRE

Inspiring Overview

What does it mean to inspire?

Youth in Worthington get involved with fun and engaging activities in Worthington starting even before they begin elementary school. The WorBots are working to build the same for STEM through the development of enriching STEM opportunities that excite youth about being involved in STEM. To inspire is to connect youth with STEM and show them that participation in STEM is tangible regardless of age, prior experience, or identity. We are working to forge opportunities through the Worthington *FIRST* Pathway for kids to get involved in addition to engaging local events—connecting them with STEM outside of the time commitment of being on a team.

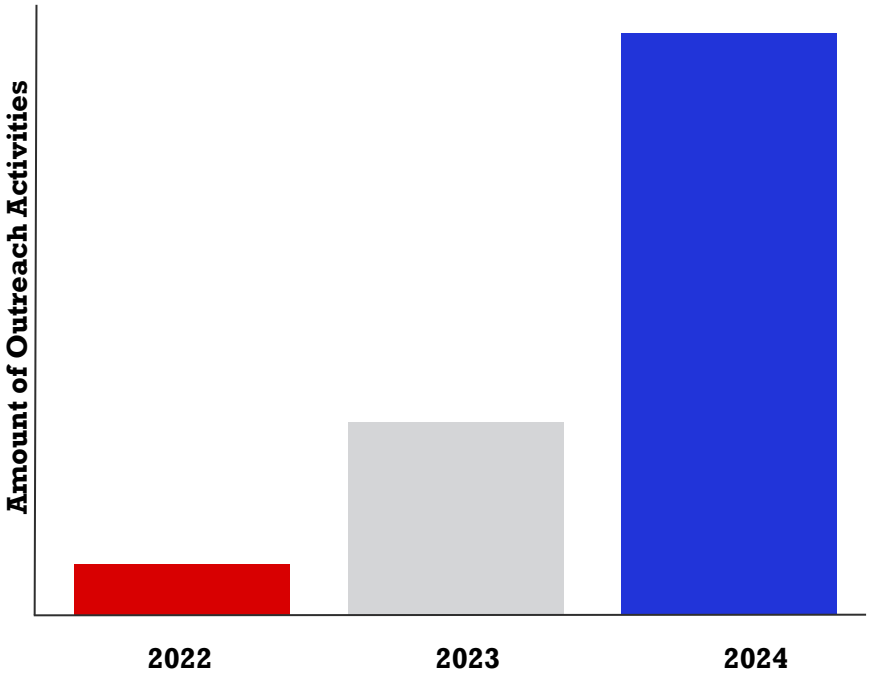
How do we inspire?

We inspire youth within our community through consistently providing exciting, interactive ways to get involved with STEM and STEM education. We work to ensure that youth are not just seeing robots, they are understanding their capabilities within STEM and get excited about their futures and current opportunities to explore STEM. We also work to connect current interests with STEM, making it sound like more than something they hear about at school.

Our inspiration-focused events include:

- *FIRST* LEGO League Mentorship
- *FIRST* Tech Challenge Mentorship
- *FIRST* LEGO League Robot Demonstrations
- *FIRST* Tech Challenge Engineering and Design Workshop
- Middle School Robotics Competition
- Informal LEGO Robotics Clubs
- Elementary School Workshops
- Middle School Workshops
- Worthington Gateway to Technology Camp
- Olentangy Caverns Geology Camp
- Elementary Science Fairs and Nights
- Alum Creek Introduction to STEM and Trades Fair
- Worthington Libraries LEGO Robotics Competitions
- Worthington Libraries Interactive STEM Workshops
- Worthington Libraries ScratchJr. Workshops
- Worthington Libraries Middle School Coding Workshops

Inspiring Overview



92%
alumni currently pursuing a career in STEM

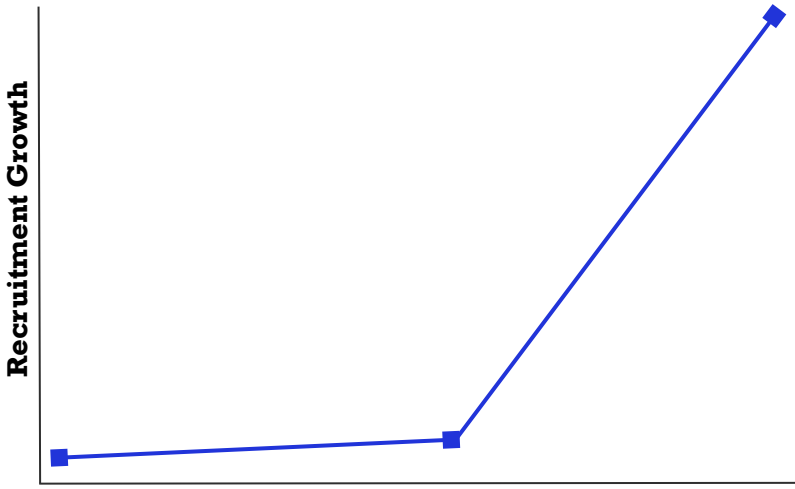
57%
members joined as of result of one of these events

6
alumni interning in STEM jobs with sponsors

100%
of members planning to pursue a career in STEM

7
kids connected to as of direct result of inspiration event

12
kids inspired to join a *FIRST* team



FIRST LEGO League Mentorship

Purpose

To inspire elementary school students who are passionate about STEM learning to explore STEM in fun and competitive ways while learning about the *FIRST* Core Values and connecting with skills and future STEM opportunities.

Event Description

We work each week with students from Wilson Hill Elementary School and Worthington Hills Elementary School on *FIRST* LEGO League teams 44451, 44452, and 61943. In addition to starting and funding this team, we provide consistent mentorship for all subteams. Mentorship for students on the programming and fabrication subteams focuses primarily on supplementing their understanding of fundamental programming concepts, as all students are currently in elementary school and may not have the prior knowledge. For innovation mentorship, we help students develop confidence in their public speaking abilities.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to ensure that "every school has an FLL/FTC team," one of our indicators of success for this long-term goal focused specifically on our Worthington *FIRST* Pathway,

$2,500

allotted to starting and sustaining *FIRST* programs for students in the Worthington feeder pathway.

120

students directly mentored in skills ranging from basic block coding to competition preparation.

95

students carried on along the next level of the Worthington *FIRST* Pathway and remained involved in their program.

82

students attended an event run by the WorBots

FIRST Tech Challenge Mentorship

Purpose

To inspire middle school students who are passionate about STEM learning to explore STEM in fun and competitive ways while learning about the *FIRST* Core Values and connecting with skills and future STEM opportunities.

Event Description

We work each week with students from Kilbourne Middle School, a local middle school in Worthington, Ohio, on *FIRST* Tech Challenge Team 16284. In addition to starting and funding this team, we provide consistent mentorship for all subteams. Mentorship for students on the programming and fabrication subteams focuses primarily on supplementing their understanding of fundamental programming concepts, as all students are currently in middle school and may not have the prior knowledge. For fundraising and administration mentorship, we help students develop confidence in their public speaking abilities.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to ensure that "every school has an FLL/FTC team," one of our indicators of success for this long-term goal focused specifically on our Worthington *FIRST* Pathway,

$1,700

allotted to starting and sustaining *FIRST* programs for students in the Worthington feeder pathway.

60

students directly mentored in skills ranging from basic block coding to competition preparation.

48

students carried on along the next level of the Worthington *FIRST* Pathway and remained involved in their program.

33

students attended an event run by the WorBots

FIRST LEGO League Robot Demonstrations

Purpose

To inspire young elementary school students who are passionate about STEM education to get involved with STEM through the *FIRST* program and get excited about their abilities and futures in STEM.

Event Description

We seasonally bring our robot for the year to each of our *FIRST* LEGO League teams' practices, where we drive it around and demonstrate its capabilities such as shooting, picking up objects, and climbing to the feeder team students. We also discuss the connections between parts of our robot and the robots that they build each seasoning, building an understanding of how the skills they are developing now on their *FIRST* LEGO League team will grow as they progress through the Worthington *FIRST* Pathway. Further, we discuss how the robot is programmed and connect it to concepts they're learning about on their team.

Through this event, we worked towards our long-term goal to "develop a high retention of students from elementary school to high school robotics programs" through working to ensure that "at least 80% of elementary school robotics program students join FRC teams" one of our indicators of success for this long-term goal.

120

students directly engaged with STEM and demonstrations of FRC-level robots and components

95

students carried on along the next level of the Worthington FIRST Pathway and remained involved in their program.

82

students attended an interactive community outreach event run by the WorBots

6

parents connected with information about how to get involved as *FIRST* mentors

Alum Creek Introduction to STEM and Trades Fair

Purpose

To connect elementary school students in Central Ohio who are interested in learning more about STEM education and future STEM careers with interactive and engaging connections to robotics and the *FIRST* program.

Event Description

For two sessions of students—a fourth grade and a fifth grade session—we demonstrated one of our demonstration robots, Basher, in 2024. We discussed how the different components of Basher work together to produce its basic functions such its movement across the room. We also displayed motors and batteries that were also on the robot and compared them to examples relatable to the kids, showing them the vast range of opportunities within STEM. We also connected the students with information about *FIRST* teams beyond Worthington, as many students were not in the Worthington City School District.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Ohio as a whole" through working to "run or participate in events reaching a broader audience within Ohio expanding beyond Worthington," one of our indicators of success for this long-term goal.

250

students directly reached with engaging demonstrations of STEM concepts and the *FIRST* program.

15

students attended another event hosted by the WorBots as a direct result of attending this event.

3

school districts represented in kids present and connected with the *FIRST* program.

1

organization partnership developed in Central Ohio.

Middle School Robotics Competition

Purpose

To connect middle school students at schools without feeder teams with competitive and enriching STEM education opportunities and encourage students to join developing *FIRST* Tech Challenge teams in their schools.

Event Description

We ran an event including sumo-style and maze LEGO robotics challenges in which groups of two robots produced and programmed by sixth and seventh-grade students worked together to compete against another group of two. This engaged students from McCord Middle School, Kilbourne Middle School, and Worthingway Middle School—inspiring kids to carry on with their STEM education through middle school and entering into high school. Predating the competition, students had six weeks to design, program, and test their robots before competitions. The LEGO robots were operating fully autonomously.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

30

students directly engaged with STEM concepts through interactive and engaging STEM opportunities

18

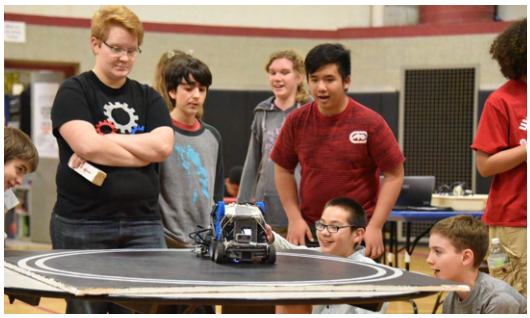
students got involved with the Worthington *FIRST* Pathway as a direct result of participating

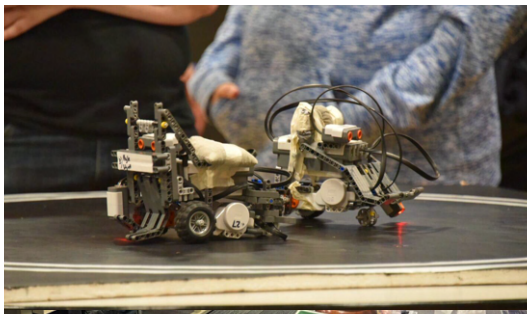
16

students attended another event hosted or run by the WorBots as a direct result of attending this event.

1

FIRST Tech Challenge team (FTC 16284) started.





Informal LEGO Robotics Clubs

Purpose

To inspire elementary school students who are passionate about STEM learning to explore STEM in fun and competitive ways while learning about the *FIRST* Core Values and connecting with skills and future STEM opportunities.

Event Description

At Wilson Hill Elementary School, we ran club meetings twice a week for LEGO robotics where students learned how to assemble and program LEGO Mindstorms and EV3 LEGO robots. We created basic challenges for them to work through such as maneuvering around obstacles and moving game elements from one area to another, helping students to develop skills and confidence in STEM and STEM concepts. This is growing into our pre-FLL program for all schools without feeder teams to encourage students to get involved and excited about robotics beginning at an early age.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

36

students connected with *FIRST* and interactive STEM education through robotics.

21

students went on to join a *FIRST* LEGO League team as a direct result of attending this event.

19

students attended another event hosted by the WorBots because they were a part of this group.

1

FIRST LEGO League team started (FLL 61943)

Elementary School Workshops

Purpose

To inspire young kids in and beyond Worthington to explore STEM through engaging, interactive activities that build STEM knowledge and confidence—encouraging them to get involved with STEM through *FIRST*.

Event Description

We regularly host elementary school students from across Worthington City Schools in our workshop. We guide students through interactive activities such as learning about the mechanical subsystems of the robot by driving the robot and observing the motion of parts. We also run design challenges where students can work in groups to design robots to solve challenges we present. We also discuss what *FIRST* looks for all ages—*FIRST* LEGO League through *FIRST* Robotics Competition—and how students can get involved regardless of prior experience or if their school has a feeder team.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

600

kids engaged with interactive STEM activities through shop tours in three seasons.

78%

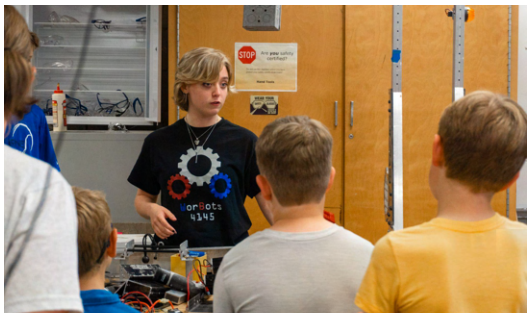
of event attendees (or parents/guardians) request more information about how to get involved with the *FIRST* pathway.

50

students attending other events hosted or run by the WorBots due to their involvement with these events.

14

students connected with the Worthington *FIRST* Pathway through FLL or FTC,



Middle School Workshops

Purpose

To encourage middle school students to get involved with STEM education starting at an early age through interactive opportunities to connect with STEM concepts and learn about how they can grow their STEM knowledge through *FIRST*.

Event Description

We regularly host middle school students from across Worthington City Schools for interactive workshops. Students learn about the fundamental components of the robot through a demonstration and a chance to drive it, where they can observe how their movement of the joystick correlated with the movement of the parts of the robot. We also run design challenges to engage students with the engineering and design process. We further connect families with information about how they can get involved with the *FIRST* Tech Challenge program.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

450

kids engaged with interactive STEM activities through shop tours in three seasons.

63

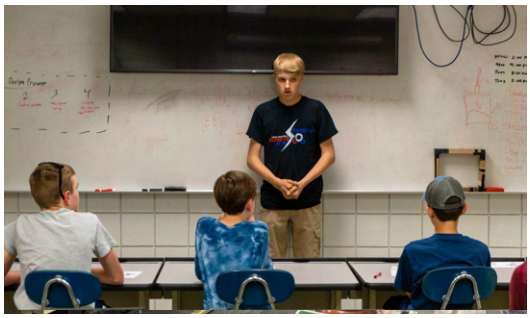
students attending other events hosted or run by the WorBots due to their involvement with these events.

54%

of event attendees (or parents/guardians) request more information about how to get involved with the *FIRST* pathway.

5

students connected with the Worthington *FIRST* Pathway through FLL or FTC,



Olentangy Caverns Geology Camp

Purpose

To connect students interested in science with connections between science fields and engineering and technology—highlighting the use of robotics in fields such as geology and exciting elementary school students about STEM.

Event Description

We attend each session of the Olentangy Caverns Geology Camp every summer to share information about the connections between the geology concepts students are engaging with and robotics—sharing how robotics and other technologies are used to enhance the field. We also demonstrate our robot for the season's driving, shooting, pick-and-place, or climbing abilities. Further, we connect elementary and middle school students with information about how they can get involved with *FIRST* LEGO League and *FIRST* Tech Challenge at their schools.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

115

elementary and middle school students directly connected with STEM learning opportunities

38

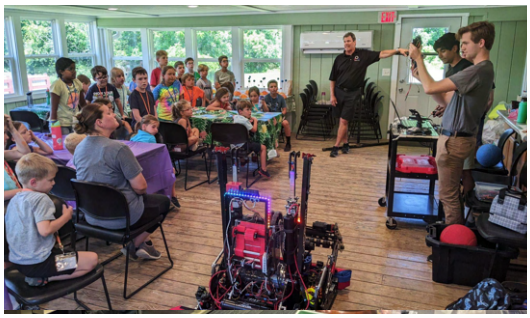
students attended another event hosted or run by the WorBots as a direct result of attending this event.

25

students directly connected with information about getting involved with *FIRST* teams.

5

school districts represented through youth connected with *FIRST*.



Elementary Science Fairs and Nights

Purpose

To inspire young elementary school students who are passionate about STEM education to get involved with STEM through the *FIRST* program and get excited about their abilities and futures in STEM.

Event Description

At elementary school science fairs and nights, we bring a robot from the season and demonstrate its capabilities such as shooting, pick-and-place, and climbing—highlighting the key mechanisms of the robot and how they work. Throughout the night, we also drive the robot and let kids interact with the robot and game elements as well as complete interactive science activities, exciting them about STEM and letting members of our community see STEM in action. We also provide information to families about the Worthington *FIRST* Pathway and how they can get involved with STEM education through the *FIRST* program.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

400

students directly engaged with STEM through informational materials and interactive STEM activities.

178

students attended another event hosted by the WorBots as a direct result of attending this event.

12

students joined the Worthington *FIRST* Pathway as a direct result of attending these events.

3

parents connected with information about how to get involved as *FIRST* mentors.

Worthington Libraries LEGO Robotics Competitions

Purpose

To connect elementary and middle school youth in Worthington with engaging, competitive STEM education opportunities that foster a fun learning environment and develop confidence and skills in STEM participation.

Event Description

We partner with the Worthington Park Library, Northwest Library, and Old Worthington Library—all of which are a part of the larger "Worthington Libraries" organization—to run LEGO robotics competitions. Here, kids start with baseline LEGO and kit robots, which they then modify to increase their chances of winning challenges such as sumo-style competitions, races, and mazes. Through this, we guide students through discussing why they are making the changes they do and being mindful about the additions they are making, introducing skills for future engineering and STEM involvement.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST*" within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally" one of our indicators of success for this long-term goal.

120

engaged directly with engaging STEM opportunities that develop skills guiding them into futures in STEM.

47

students attended an interactive community outreach event run by the WorBots

7

students went on to join the Worthington *FIRST* Pathway as a direct result of attending these events,

6

Worthington City Schools elementary schools represented.

Worthington Libraries Interactive STEM Workshops

Purpose

To connect pre-school and elementary school-aged youth in Worthington with engaging, competitive STEM education opportunities that foster a fun learning environment and develop confidence and skills in STEM participation.

Event Description

We partner with the Worthington Park Library, Northwest Library, and Old Worthington Library—all of which are a part of the larger "Worthington Libraries" organization—to run STEM workshops where kids can learn about fundamental STEM concepts hands-on by working with pre-developed robots. We work with kids as they code Code-A-Pillars, work to program Spark Indi Robots, and work to drive Dash and Dots through specialized mazes, introducing fundamental skills within STEM and exciting kids about their futures and abilities in programming and robots,

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST*" within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally" one of our indicators of success for this long-term goal.

100

engaged directly with engaging STEM opportunities that develop skills guiding them into futures in STEM.

21

students attended an interactive community outreach event run by the WorBots

4

students went on to join the Worthington *FIRST* Pathway as a direct result of attending these events,

3

Worthington City Schools elementary schools represented.

Worthington Libraries ScratchJr. Workshops

Purpose

To connect pre-school and elementary school-aged youth in Worthington with engaging, competitive STEM education opportunities that foster a fun learning environment and develop confidence and skills in STEM participation.

Event Description

In partnership with the Worthington Park Library, we run ScratchJr. introductory workshops for preschool and elementary school students. We first introduce basic programming logic through playing games such as "Zip, Zap, Zorp," where students learn about the importance of logical ordering. We then introduce the concepts of the start and end tiles, discussing how their sequence in the code is important. We then introduce the basic movement and sound tiles, and give kids a chance to explore ways to make their character move as they wish, giving provisions regarding required actions and required number of tiles.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST*" within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally" one of our indicators of success for this long-term goal.

30

engaged directly with engaging STEM opportunities that develop skills guiding them into futures in STEM.

6

students attended an interactive community outreach event run by the WorBots

3

Worthington City Schools elementary schools represented through students in attendance.

1

local business partnership developed with a parent.

Worthington Libraries Middle School Coding Workshops

Purpose

To connect middle school-aged youth in Worthington with engaging, competitive STEM education opportunities that foster a fun learning environment and develop confidence and skills in STEM participation.

Event Description

In partnership with the Worthington Park Library, we run ScratchJr. introductory workshops for preschool and elementary school students. We first introduce basic programming logic through playing games such as "Zip, Zap, Zorp," where students learn about the importance of logical ordering. From there, we introduce them to engaging coding and logic challenges where they can develop STEM skills through experience. For example, we ran a coding escape room where students had to use programming logic to make their way through challenges.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST*" within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally" one of our indicators of success for this long-term goal.

24

engaged directly with engaging STEM opportunities that develop skills guiding them into futures in STEM.

7

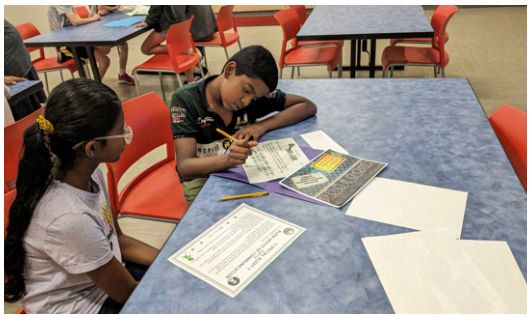
students attended an interactive community outreach event run by the WorBots

4

Worthington City Schools middle schools represented through students in attendance.

1

student joined the Worthington *FIRST* Pathway as a result of attending this event



WE IMPACT

Impact Overview

What does it mean to impact?

For the WorBots, it is vital that we forge connections between the Worthington community and STEM education holistically. We are working our community by mobilizing opportunities such as connection with STEM from an early age, reaching STEM regardless of prior experience, and learning about STEM through immersive and engaging experiences. In and beyond, impacting involves supporting *FIRST* teams and building up opportunities for youth globally to expand their understanding of STEM. Furthermore, impacting involves using team skills to give back to our community and positively support initiatives bringing support to those in need.

How do we impact?

We impact members of our community through consistent efforts to connect youth through STEM. By connecting kids of all ages through their interest in STEM and STEM education, we are cultivating a culture of STEM in Worthington, Ohio. We partner with teams even beyond Worthington to support and uplift *FIRST* teams across the globe, ensuring that teams have resources and information they need to succeed. We further partner with local organizations to give back to and support our community.

Our impact-focused events include:

- Girl Scouts
- SWE Next
- Worthington *FIRST* Banquet
- Worthington Science Day
- *FIRST* LEGO League Mentorship
- *FIRST* Tech Challenge Mentorship
- FLL Shop Tour
- FTC Workshop Tour
- FTC Engineering and Design Workshop
- Gateway to Technology Camp
- Worthington Schools Robot Reveal
- Worthington School Board Presentations
- Mentoring FRC Team 6916
- FRC Team 8856 Assistance
- Germany *FIRST* Support
- FRC Team 7565 Assistance
- FRC Team 9487 Assistance
- FRC Team 7567 Assistance
- Safety Kits
- International Spirit Squad
- Publishing Operations Resources
- Publishing Technical Resources
- 3D-Printing Adapted Toys
- LEGO Drive for Nationwide Children's Hospital
- Turn for Troops
- Habitat for Humanity
- Resource Pantry Drives

Impacting Overview

200,000+

people reached directly through community outreach initiatives in 3 years.

128

community and global outreach events in 3 years.

100+

students currently in the Worthington *FIRST* pathway

27

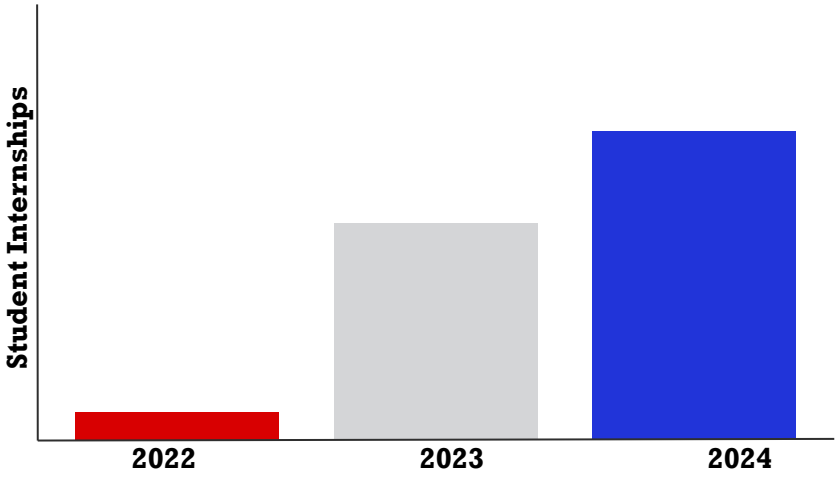
WorBots published resources available to *FIRST* teams for technical and team operations

41

FIRST teams worked with through consistent assistance or mentorship

02

Worthington City Schools high schools now including expanded STEM spaces as a direct result of our advocacy



Girl Scouts Workshops

Purpose

To inspire young girls to get involved with STEM education and opportunities by fostering STEM skills, confidence, and leadership skills by connecting elementary school girls with women leading in STEM at the high school level.

Event Description

We seasonally invite groups of elementary school Girl Scouts into our workshop and guide them through interactive activities to help them earn their robotics badges. For the first grade groups, we guide them through learning how robots move by driving them—even giving them "robot driver's licenses" to engage them. We also teach them fundamental leadership skills through fun activities, preparing them to be leaders in STEM. For older elementary school students, we run engineering and design workshops where we introduce them to the engineering and design process.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST*" within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally," one of our indicators of success for this long-term goal.

150

Girl Scouts directly connected with interactive STEM education opportunities and robotics badges

76

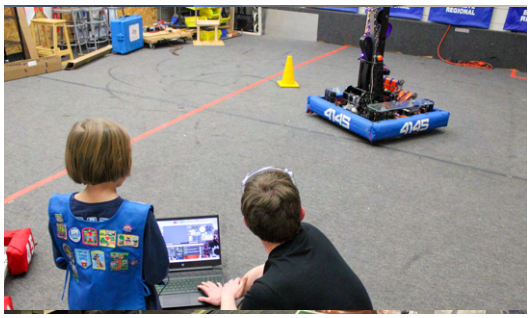
students attended another outreach event hosted by the WorBots as a direct result of attending this event.

6

different types of badges earned by students for activities at these interactive events.

5

parents connected with information about how to get involved with *FIRST*



Society of Women Engineers (SWE) Next Workshops

Purpose

To inspire women who are interested in engineering at the high school level to expand upon their involvement in STEM and their STEM knowledge through participating in the *FIRST* program.

Event Description

We invite the Society of Women Engineers (SWE) Next groups from Thomas Worthington High School and Worthington Kilbourne High School. These events are either focused on recruitment for *FIRST* programs or joint women in STEM events. For recruitment events, we discuss how we are expanding upon classroom learning through *FIRST* and preparation for post-secondary STEM education and careers. For joint events, we guide young girls in our community through interactive STEM education opportunities such as driving robots, learning about electrical components, and design workshops.

Through this event, we worked towards our long-term goal to "mature our relationship with the SWE Next group within both schools" through working to ensure that we" [run] 2 or more events with them annually" and "10 members join from that program," two of our indicators of success for this long-term goal.

100

young girls in our community directly connected with interactive STEM education opportunities.

50

women at the high school level connected with interactive STEM education opportunities.

37

attendees attended another event hosted by the WorBots or joined the WorBots as a direct result.

12

engineering teachers connected with the WorBots' mission.

Worthington *FIRST* Banquet

Purpose

To foster connection between the multiple levels of the Worthington *FIRST* Pathway, connect students with the opportunities in their future through the Worthington *FIRST* Pathway, and build retention of students and families.

Event Description

We annually hold an end-of-season event with all of the Worthington *FIRST* teams—FLL 44451, FLL 44452, FLL 61843, FTC 16284, and FRC 4145. Each team displays their robot for the season and demonstrates autonomous and TeleOp capabilities. They also discuss their community involvement and their work with other teams. From there, families and attendees go to the sections for each team and hear from the students about their learning and successes as a team. Then, our high school students on FRC 4145 present students on the younger teams with certificates and awards recognizing their accomplishments that season.

Through this event, we worked towards our long-term goal to "develop a high retention of students from elementary school to high school robotics programs" through working to ensure "all feeder team students have the opportunity to connect to WorBots annually," one of our indicators of success for this long-term goal.

100

Students and their families directly reached and connected with the levels of the *FIRST* Pathway.

87

students carried on through the Worthington *FIRST* Pathway or went on to pursue post-secondary STEM education

25

pre-elementary students reached and excited about STEM and robotics opportunities

2

mentors recruited for the Worthington *FIRST* Pathway

Worthington Science Day

Purpose

To connect the Worthington community as well as students interested in STEM innovation with expansive STEM education opportunities through every level of the Worthington *FIRST* pathway.

Event Description

In the main section of the Worthington Science Day, we ran an informational booth and drove our seasonal robot while playing match videos from each season we have competed in. We provided information regarding how students and families can get involved in the Worthington *FIRST* Pathway regardless of age, grade level, or previous experience. We also provided information to science-focused community members interested in getting involved with our team. Further, we ran mini design challenges throughout the day to engage kids and their creativity with real-world problem-solving applications.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in at least 3 whole-community events seasonally" one of our indicators of success for this long-term goal.

1,500

people reached through interactive STEM education opportunities and informational materials.

18

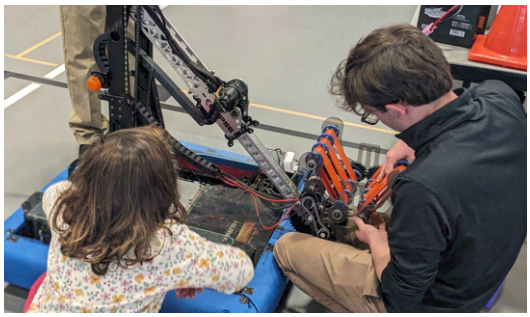
students citing as a reason they learned about the WorBots and decided to join the Worthington *FIRST* Pathway

6

Worthington City Schools administrators connected with further insight on Worthington *FIRST*

1

new mentor acquired.



FIRST LEGO League Mentorship

Purpose

To inspire elementary school students who are passionate about STEM learning to explore STEM in fun and competitive ways while learning about the *FIRST* Core Values and connecting with skills and future STEM opportunities.

Event Description

We work each week with students from Wilson Hill Elementary School and Worthington Hills Elementary School on *FIRST* LEGO League teams 44451, 44452, and 61943. In addition to starting and funding this team, we provide consistent mentorship for all subteams. Mentorship for students on the programming and fabrication subteams focuses primarily on supplementing their understanding of fundamental programming concepts, as all students are currently in elementary school and may not have the prior knowledge. For innovation mentorship, we help students develop confidence in their public speaking abilities.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to ensure that "every school has an FLL/FTC team," one of our indicators of success for this long-term goal focused specifically on our Worthington *FIRST* Pathway,

$2,500

allotted to starting and sustaining *FIRST* programs for students in the Worthington feeder pathway.

120

students directly mentored in skills ranging from basic block coding to competition preparation.

95

students carried on along the next level of the Worthington *FIRST* Pathway and remained involved in their program.

82

students attended an event run by the WorBots

FIRST Tech Challenge Mentorship

Purpose

To inspire middle school students who are passionate about STEM learning to explore STEM in fun and competitive ways while learning about the *FIRST* Core Values and connecting with skills and future STEM opportunities.

Event Description

We work each week with students from Kilbourne Middle School, a local middle school in Worthington, Ohio, on *FIRST* Tech Challenge Team 16284. In addition to starting and funding this team, we provide consistent mentorship for all subteams. Mentorship for students on the programming and fabrication subteams focuses primarily on supplementing their understanding of fundamental programming concepts, as all students are currently in middle school and may not have the prior knowledge. For fundraising and administration mentorship, we help students develop confidence in their public speaking abilities.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to ensure that "every school has an FLL/FTC team," one of our indicators of success for this long-term goal focused specifically on our Worthington *FIRST* Pathway,

$1,700

allotted to starting and sustaining *FIRST* programs for students in the Worthington feeder pathway.

60

students directly mentored in skills ranging from basic block coding to competition preparation.

48

students carried on along the next level of the Worthington *FIRST* Pathway and remained involved in their program.

33

students attended an event run by the WorBots

FIRST LEGO League Shop Tours

Purpose

To inspire elementary school students who are passionate about STEM learning to explore STEM while working with role models from the high school programs to learn new skills and get excited about *FIRST* in their futures.

Event Description

Each season, we invite students from our *FIRST* LEGO League teams FLL 44451, FLL 44452, and FLL 61943 into our workshop to learn more about STEM as they progress throughout the Worthington *FIRST* Pathway. They drive our robot for the season and try to score a game element, then they drive one of our demonstration robots through a course. Following this, we discuss the *FIRST* Core Values with the students as well as their next step into FTC. Then, they present their team and innovation project for the season and tell us more about how their team's season went.

Through this event, we worked towards our long-term goal to "develop a high retention of students from elementary school to high school robotics programs" through working to ensure "all feeder team students have the opportunity to connect to WorBots annually," one of our indicators of success for this long-term goal.

40

students directly connected with the *FIRST* Robotics Competition level of the Worthington *FIRST* Pathway.

34

students carried on through the Worthington *FIRST* Pathway the following season.

4

parents connected with resources to become mentors for the Worthington *FIRST* Pathway

1

parent said we were "more impressive than work at the collegiate level."

FIRST Tech Challenge Shop Tours

Purpose

To inspire middle school students who are passionate about STEM learning to explore STEM while working with role models from the high school programs to learn new skills and get excited about *FIRST* in their futures.

Event Description

Each season, we invite students from our *FIRST* Tech Challenge teams FTC 16284 into our workshop to learn more about STEM as they progress throughout the Worthington *FIRST* Pathway. They drive our robot for the season and try to score a game element, then they drive one of our demonstration robots through a course. Following this, we discuss the *FIRST* Core Values with the students as well as their next step into FRC. Then, they present their team and community involvement for the season—discussing their successes and areas they hope to improve and asking any questions they have.

Through this event, we worked towards our long-term goal to "develop a high retention of students from elementary school to high school robotics programs" through working to ensure "all feeder team students have the opportunity to connect to WorBots annually," one of our indicators of success for this long-term goal.

20

students directly connected with the *FIRST* Robotics Competition level of the Worthington *FIRST* Pathway.

20

students carried on through the Worthington *FIRST* Pathway the following season.

16

families requested more information regarding more ways to get involved with STEM between FTC and FRC

1

parent became a mentor for the Worthington *FIRST* Pathway

FIRST Tech Challenge Engineering and Design Workshop

Purpose

To inspire middle school students who are passionate about STEM learning to explore STEM in fun and competitive ways while learning about the *FIRST* Core Values and connecting with skills and future STEM opportunities.

Event Description

We invite our *FIRST* Tech Challenge students from FTC 16284 into our workshop the Monday after the game for FTC is released. We facilitate a game analysis for the students in which they take note of the different ways in which they can earn points during a match. We then answer any questions students have about the game and game manual, and run a group design session where all of the students create an initial design and discuss the strengths and limitations. During this, we explain underlying STEM concepts they may not have learned yet due to their students all being in middle school.

Through this event, we worked towards our long-term goal to "develop a high retention of students from elementary school to high school robotics programs" through working to ensure that "at least 80% of elementary school robotics program students join FRC teams" one of our indicators of success for this long-term goal.

100%

of attendees stated they felt more prepared for their competition season by the time they left.

60

students directly mentored and guided through the initial design process for their season.

48

students carried on along the next level of the Worthington *FIRST* Pathway and remained involved in their program.

33

students attended an event run by the WorBots

Worthington Gateway to Technology Camp

Purpose

To inspire elementary and middle school students who are interested in lSTEM to get involved through hands-on interactive activities blending STEM concepts with creative challenges, creating tangible and fun learning experiences regardless of prior experience.

Event Description

During the summer, we guide students through interactive STEAM activities throughout the course of a week. We guide students as they work to solve challenges as opposed to providing answers and teach them about the underlying STEM concepts behind some of the activities they are doing. A key activity elementary school students work on is active origami, where students work to create origami animals then add LED lights and motors connected by conductive tape—teaching the flow of energy. For middle school students, we run a cardboard boat challenge, teaching students about structurally sound design.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

140

students directly connected with *FIRST* through engaging STEAM education opportunities

63

students attended another event hosted or run by the WorBots as a direct result of attending this event.

26

middle school students connected with more information about engineering coursework for middle school

9

students joined the Worthington *FIRST* Pathway.

Worthington Schools District Robot Reveal

Purpose

To connect members of the Worthington City School Board and administrators in the Worthington City School District with the progress and learning of students at the high school level of Worthington *FIRST* while advocating for pathway resources.

Event Description

Each season, we invite members of the Worthington City School Board as well as high school administrators and the directors of primary and secondary education. We present our program to attendees and discuss the impact *FIRST* had on our community that season. From there, we discuss the ways the district can increase STEM education opportunities, such as funding for FLL and FTC coaches. We then reveal our robot for the seacon and give attendees a chance to drive it, showing the broad range of capabilities each year and the progress of student learning through *FIRST*.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that "we have 5 members of the Worthington City School Board in our shop annually," one of our indicators of success for this long-term goal.

100%

of administrators stated they wanted to get involved in the Worthington *FIRST* Pathway

21

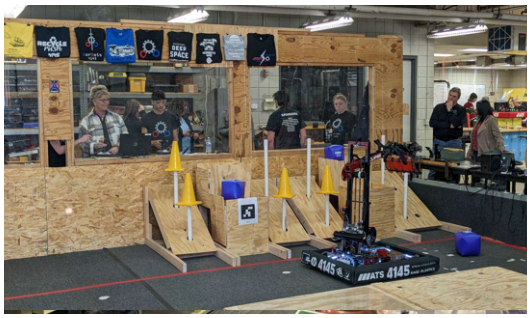
Worthington City Schools administrators connected with STEM and the Worthington *FIRST* Pathway

5

Worthington *FIRST* teams with increased funding and district support from Worthington City Schools.

3

subsequent meetings with school district administrators



Worthington School Board Presentations

Purpose

To share the progress of the Worthington *FIRST* Pathway with school administrators and connect them with STEM education and learning experiences through *FIRST* as well as the successes of the teams in Worthington.

Event Description

At Worthington City Schools school board meetings, we bring our robot and our entire team following our final event for the season—whether that be states, worlds, or our third regional. We drive the robot and demonstrate the capabilities that it has to complete the challenge for the season, such as pick-and-place or shooting. Then, our student presidents speak to the school board about how our season went—overviewing the successes and areas of improvement following each regional event into any subsequent competitions. Finally, we discuss upcoming events such as CORI, which we host, and formally invite the board.

Through this event, we worked towards our long-term goal to "expand the presence of *FIRST* within Worthington and Worthington Schools" through working to "run or participate in events at all schools — regardless of feeder team status," one of our indicators of success for this long-term goal.

100%

of administrators stated they wanted to get involved in the Worthington *FIRST* Pathway

19

Worthington City Schools administrators connected with STEM and the Worthington *FIRST* Pathway

5

Worthington *FIRST* teams with increased funding and district support from Worthington City Schools.

4

subsequent district publications highlighting our team.

Mentoring *FIRST* Robotics Competition Team 6916

Purpose

To support Central Ohio *FIRST* teams through ensuring sustainable access to resources and information that are vital to success, uplifting STEM education across the local community and the state.

Event Description

In 2022, we began working with *FIRST* Robotics Competition Team 6916, Iron Thunder. Following the Covid-19 pandemic, they were struggling to find mentorship and sponsorship. We let them work out of our workshop and we guided them through fabricating parts for their robot and programming systems they were unfamiliar with. We also connected them with one of our sponsors and helped them get materials for their robot. At competitions, we worked with them in their pit after every match. This season, they struggled to find membership, but we are helping them compete again in the 2024-2025 season.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

16

students directly mentored throughout the course of the 2022-2023, Charged Up, season.

14

virtual sessions beyond quick consults throughout the 2022-2023 season to guide students in preparing for competition.

9

work sessions held directly in our workshop during team meetings in addition to virtual support.

1

sponsor connected with FRC Team 6916, Iron Thunder

FIRST Robotics Competition Team 8856 (9545) Assistance

Purpose

To support and uplift the global *FIRST* community through serving as a resource for teams to receive any information their team needs to thrive throughout the season and at competitions—from technical to operational needs.

Event Description

In 2022, we began working with *FIRST* Robotics Competition Team 8856 (now 9545), Lapis Lazuli, a team from Turkey. When we first started working with them, they were looking to expand upon their involvement within their community and focus on both reaching out through STEM and giving back through community service work. We answer questions and exchange information throughout each season regarding outreach, giveback, fundraising, and team operations—providing resources along the way. We also provided a sample competition packing list and helped them prepare for their first competition in 2023.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

23

students on the team directly impacted through virtual mentorship throughout the seasons.

9

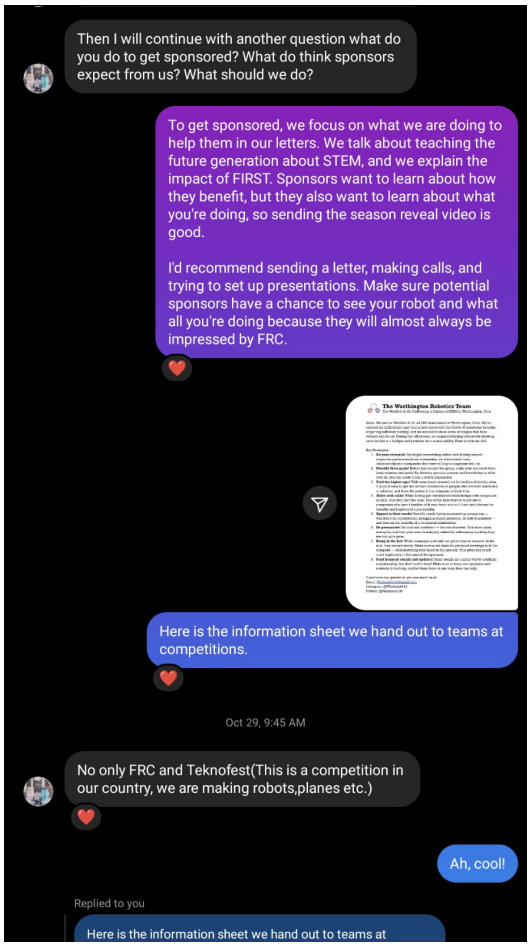
community outreach and involvement initiatives in Turkey run by FRC 8856 directly influenced.

6

resources providing regarding team operations and seasonal sustainability digitally.

2

sponsors gained for *FIRST* Robotics Competition Team 8856.



Germany *FIRST* Robotics Support

Purpose

To support and uplift the global *FIRST* community through serving as a resource for teams to receive any information their team needs to thrive throughout the season and at competitions—from technical to operational needs.

Event Description

In 2023, we met a student interested in starting a *FIRST* Robotics Competition team with a local university in Germany. He was struggling to prepare sample budgets, business plans, and informational materials, as the university he would be pitching it to had little awareness of *FIRST*, and there is minimal *FIRST* presence across Germany. Moreover, he was pitching it to a primarily English-speaking department despite his first language being German. We met with him virtually and helped him develop a group of interested students in Germany and prepare presentation materials for the university.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

15

students directly impacted by work to develop a *FIRST* Robotics Competition team in Germany.

6

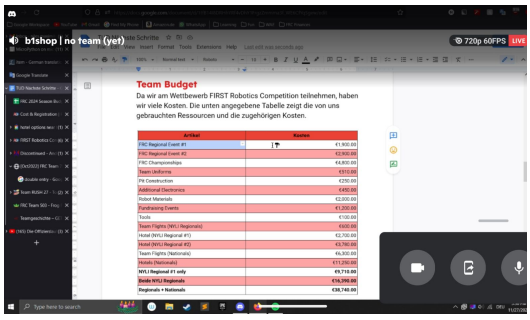
schools involved in presentations regarding starting a *FIRST* Robotics Competition team for students.

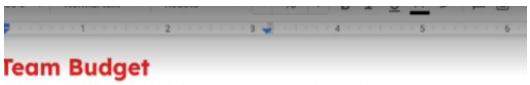
3

resultant meetings with the university as a direct result of the strong pre-planning for financials.

1

connection with a STEM initiative in Germany formed.





Artikel	Kosten
FRC Regional Event #1	€1,900
FRC Regional Event #2	€2,900
FRC Championships	€4,800
Team Uniforms	€510
Pit Construction	€250
Additional Electronics	€450
Robot Materials	€2,000
Fundraising Events	€1,200
Tools	€100
Team Flights (NYLI Regionals)	€600
Hotel (NYLI Regional #1)	€2,700
Hotel (NYLI Regional #2)	€3,780
Team Flights (Nationals)	€6,300
Hotels (Nationals)	€11,250
NYLI Regional #1 only	**€9,710**
Beide NYLI Regionals	**€16,390**
Regionals + Nationals	**€38,740**

FIRST Robotics Competition Team 7565 Assistance

Purpose

To support and uplift the global *FIRST* community through serving as a resource for teams to receive any information their team needs to thrive throughout the season and at competitions—from technical to operational needs.

Event Description

In 2023, we began meeting with *FIRST* Robotics Competition Team 7565. They previously had very strong community involvement including a strong impact on the STEM curriculum for students in Brazil, and they were looking to branch out into submitting for the *FIRST* Impact Award. We met with them on Zoom to answer questions regarding the Impact Award submission and presentation, then provided resources from our previous award submissions. We also remained in contact throughout the season and helped them edit their final 2024 Impact Award submission.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

30

students on *FIRST* Robotics Competition Team 7565 directly impacted by information and resources

21

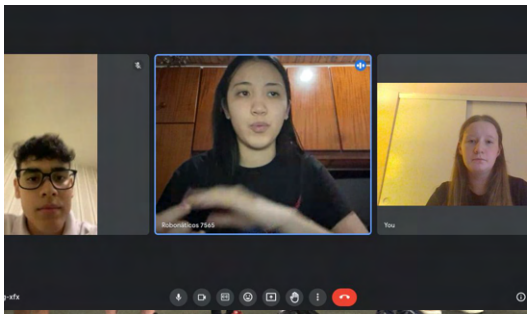
suggestions for the written submission to help clarify key points of their submission from an outside perspective

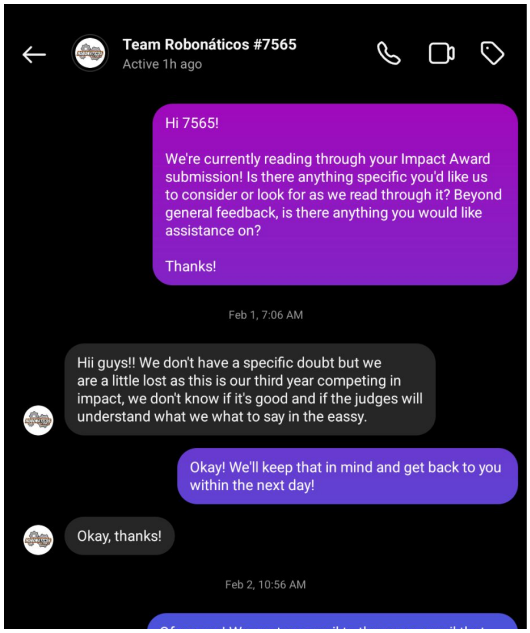
3

students from FRC 7565 directly met with through Zoom meetings with the team to prepare for competitions

1

Zoom call outside of asynchronous messaging to provide information





FIRST Robotics Competition Team 9487 Assistance

Purpose

To support and uplift the global *FIRST* community through serving as a resource for teams to receive any information their team needs to thrive throughout the season and at competitions—from technical to operational needs.

Event Description

In 2023, we began meeting with *FIRST* Robotics Competition Team 9487. At the time, they were a pre-rookie team and had not yet registered. We discussed what a *FIRST* Robotics Competition season typically looks like for us and how each subteam within our team comes together to successfully operate each year. We then answered questions regarding programming, fabrication, robot design, and operations, helping the team get prepared for their upcoming season. Throughout the season, we reached out and remained in contact to ensure they had a support system as they progressed through their rookie season.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

20

students on *FIRST* Robotics Competition Team 9487 directly impacted by information and resources.

3

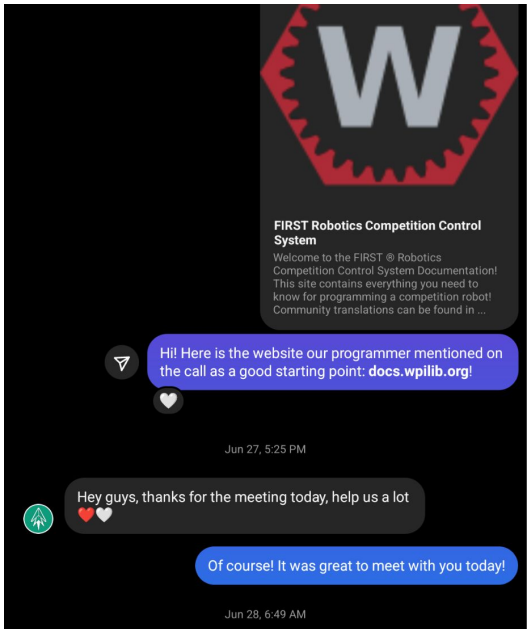
resources we directly connected the team with during our off-season meeting to prepare them for build season.

2

members of the team met with to discuss team operations and preparation for competition season.

1

Zoom call outside of asynchronous messaging to provide information.



FIRST Robotics Competition Team 7567 Assistance

Purpose

To support and uplift the global *FIRST* community through serving as a resource for teams to receive any information their team needs to thrive throughout the season and at competitions—from technical to operational needs.

Event Description

In 2023, we began meeting with *FIRST* Robotics Competition Team 7567. They previously had very strong community involvement including many community outreach events, and they were looking to branch out into submitting for the *FIRST* Impact Award as well as improving their team operations as a whole. We met with them on Zoom to answer questions, then provided resources from our previous award submissions and sustainability materials. We also remained in contact throughout the season to follow-up on their team's progress throughout the season and any questions that arose.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

40

students on *FIRST* Robotics Competition Team 7567 directly impacted by information and resources

15

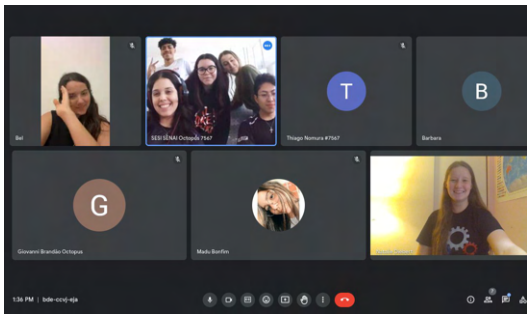
students from FRC 7567 directly met with through Zoom meetings with the team to prepare for competitions

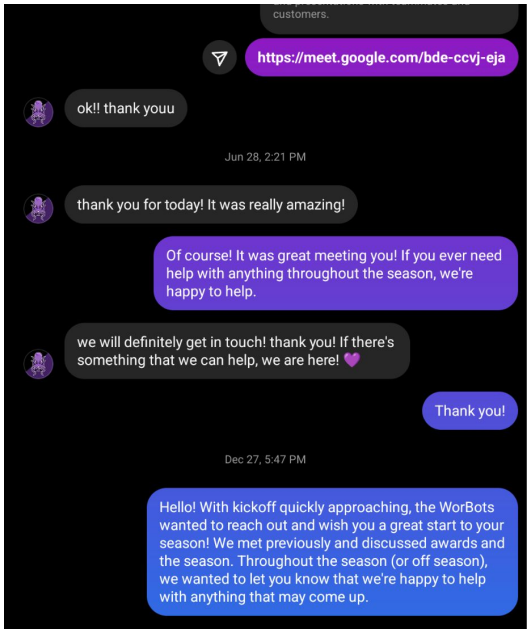
3

resources we directly connected the team with during our off-season meeting to prepare them for build season.

1

Zoom call outside of asynchronous messaging to provide information





Safety Kits

Purpose

To provide necessary resources for safety and well-being to *FIRST* Robotics Competition teams at events we are attending and ensure that all teams have access to materials they need to safely compete.

Event Description

Each season, we make safety kits for teams at every regional we are attending as well as for teams in our division at the *FIRST* Championship if we qualify. These kits include bandages, hair ties, ear plugs, alcohol wipes, antibiotic ointments, informational materials, and pins to address common challenges such as loose hair that may pose a risk to teams at competitions. For rookie teams, we also provide rookie bags with cards, advice from a returning team, safety materials, and small gifts. Through this, we are working to ensure teams feel safe and welcomed at competition.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

700

safety kits given to other teams in the past three competition seasons (excluding 2020/2021)

250

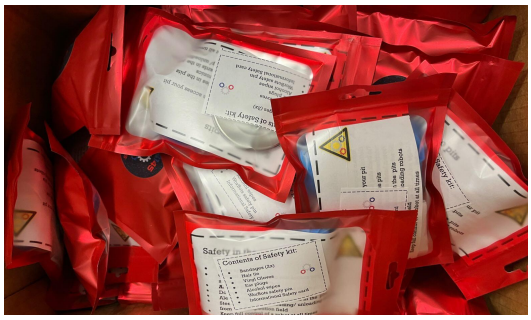
safety kits provided to teams last season to ensure that teams had the resources they needed at competition

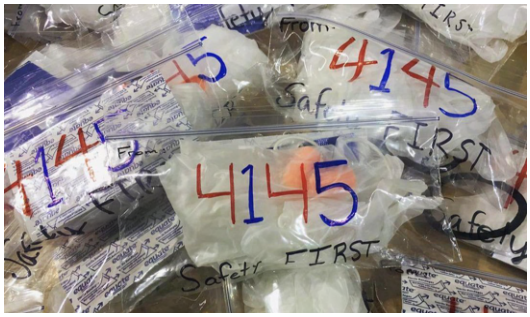
113

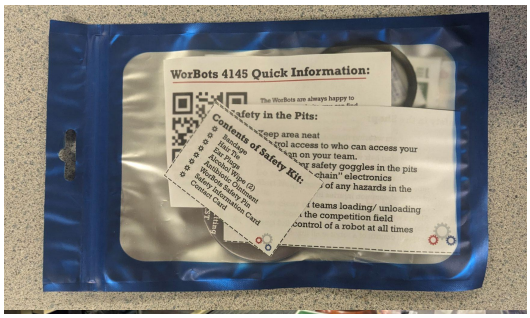
teams interacted with safety resources as a direct result of information provided in the kits

15

rookie bags prepared to give to teams during this season.







International Spirit Squad

Purpose

To support and uplift the global *FIRST* community through supporting teams who may not have team members to cheer them on during competitions due to geographic or other barriers.

Event Description

Founded in 2023, we run an initiative called our "International Spirit Squad," where we make signs and materials to cheer on teams coming from countries outside of the United States to regional competitions where they may not be able to bring many of their teammates due to the far distance and travel requirements. At these competitions, a group of our students, upon receiving permission from the team, join their families in their seating section and cheer them on during every match—even when they might be competing on the opposing alliance. We also have signs in our stands for the teams to further cheer them on.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

14

spirit items made for teams who we have competed with or will be seeing during this season

5

teams contacted pre-competition to connect on ways we could support them at the regional (if any)

3

teams directly cheered on through this initiative (founded in our third regional of 2023)

2

team parents from the teams noted that "this was why they loved *FIRST*."

Publishing Operations Resources

Purpose

To support *FIRST* teams across the globe by ensuring they have access to information and materials that they need in order to sustain their team, expand their operations, and succeed as a program.

Event Description

We regularly produce resources to share our methodology for consistently growing our team and its operations and support other teams. For example, at the end of each season, we publish our business plan—highlighting how our team operated and sustained team operations in order to maximize our productivity and involvement locally. We also share our branding standards full document, a holistic overview of how we ensure our brand is maintained across all team publications, materials, and attire. Further, we share our sponsor level sheets and sponsorship resources to support teams in acquiring funding.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

130

teams directly reached through virtual resources focused on seasonal team operations.

75

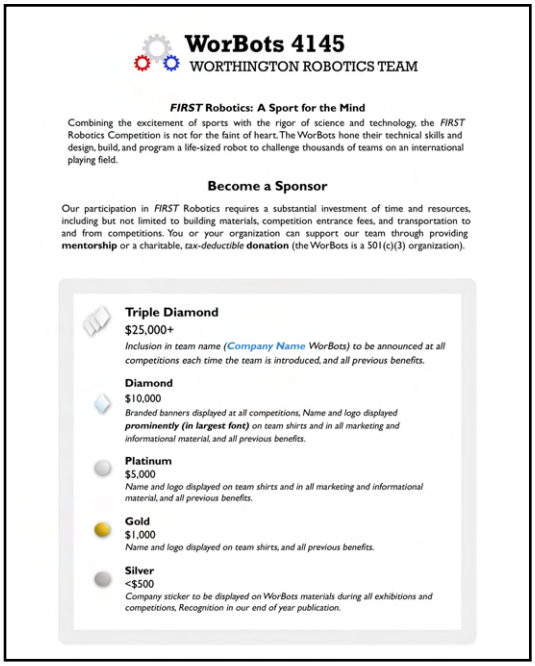
teams physically provided with operations resources during the 2023 competition season.

20

unique team operations-focused resources ranging from fundraising to safety published

7

unique topics within operations covered through published resources



Publishing Technical Resources

Purpose

To support *FIRST* teams across the globe by ensuring they have access to information and materials that they need in order to sustain their team, expand their operations, and succeed as a program.

Event Description

We regularly produce resources to share our methodology for producing an effective robot and consistent code each season. At the end of each season, we publish all of our annotated code including code for our vision systems and robot—providing an understanding of how we controlled our robot throughout the competition. We also provide information regarding how our robot was fabricated through our technical binders, which explain the subcomponents of the robot for the season, the process by which we arrived at the decision to use them, and their modifications throughout the season.

Through this event, we worked towards our long-term goal to "mature partnerships with businesses, schools, and educational institutions" through working to ensure that we "reach groups beyond our small community and maintain means of doing so," one of our indicators of success for this long-term goal.

210

teams directly reached through virtual resources focused on seasonal team operations.

16

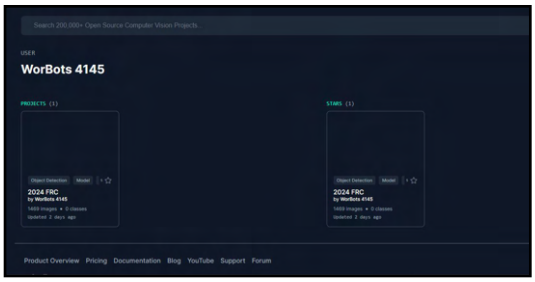
teams physically provided with technical resources during the 2023 competition season.

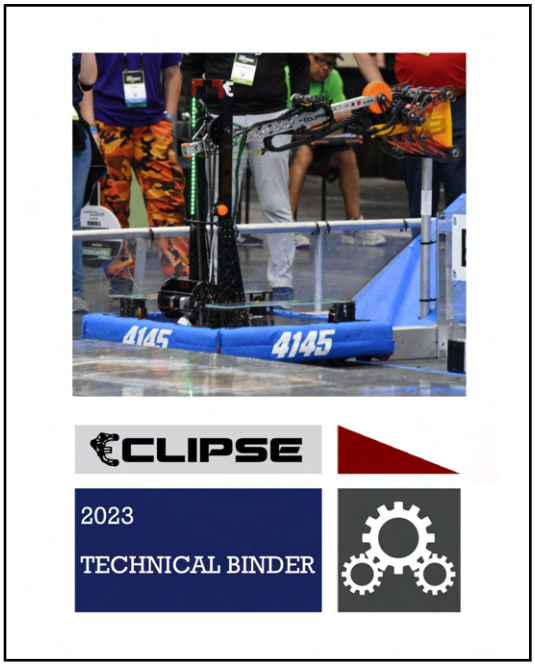
5

unique team operations-focused resources ranging from robot code to CAD

3

subteams covered through information in technical resources





3D-Printing Adapted Toys

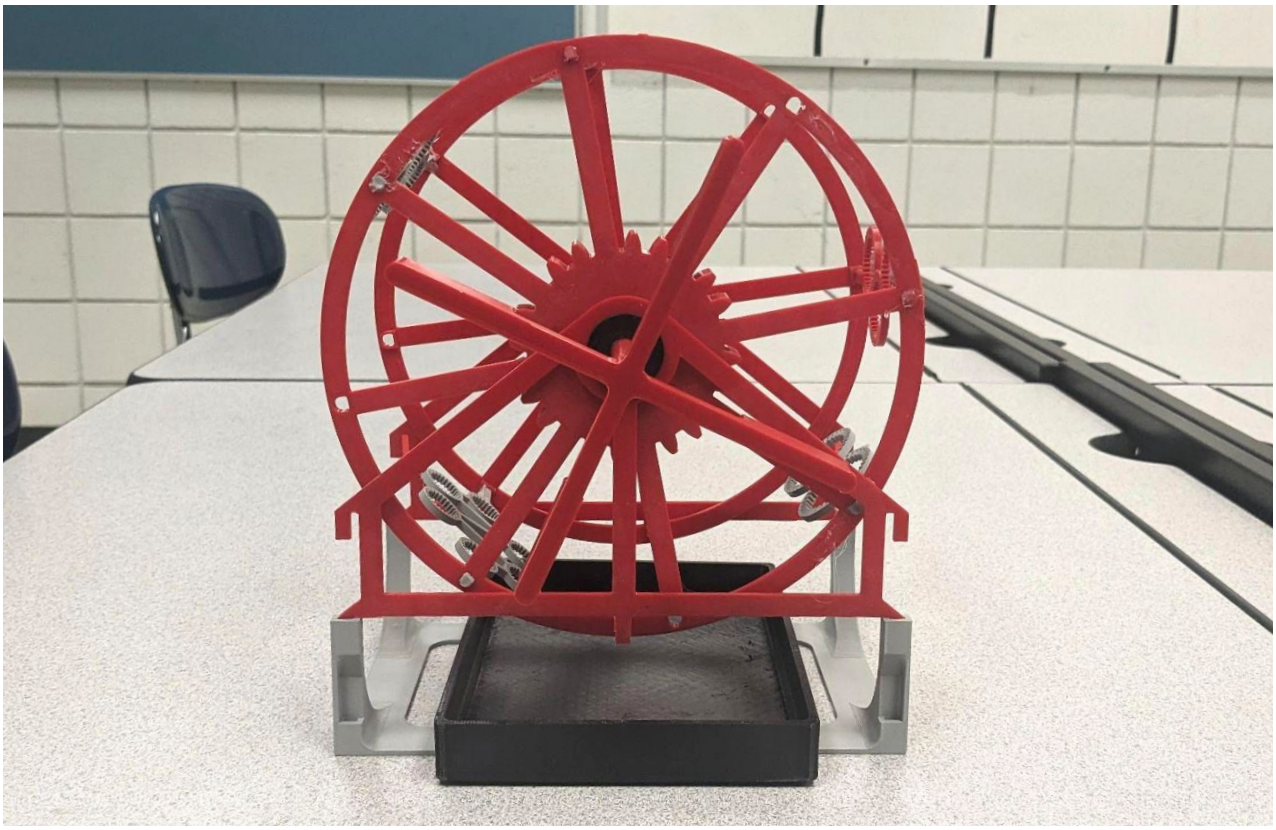
Purpose

To ensure that young students in the Worthington City School District have equal access and opportunity to have fun and play with one another and remove barriers created by inaccessible toys.

Event Description

This year, we were contacted by a teacher at Sutter Park Preschool, a preschool in the Worthington City School District. She shared that she had a student with limited mobility who liked lights, sounds, and sensory input such as bubbles. She had been working on making courses such as blocked that knocked over a race car, but she was running out of ideas and was hoping to make more permanent adaptive toys for him. We worked on developing a ferris wheel that spun and blew bubbles when he pushed on a lever, which we could then give to him for his school!

Through this event, we worked towards our long-term goal to "serve our community through giveback activities" through working to ensure that we participate in "4145 hours of active community outreach work within or beyond the Worthington community," one of our indicators of success for this long-term goal.



LEGO Drive for Nationwide Children's Hospital

Purpose

To provide engaging and fun STEM activities that can be collaborative or individual to siblings of youth in Nationwide Children's Hospital who are staying with their families in the Ronald McDonald House.

Event Description

Each season, we partner with the *FIRST* LEGO League teams in the Worthington *FIRST* Pathway—FLL 44451, FLL 44452, and FLL 61943—as well as Evening Street Elementary School to collect LEGO kits for the Ronald McDonald House of Nationwide Children's Hospital. This organization houses the families of children who are in the hospital free of charge and provides activities to the young siblings of kids in the hospital who are staying there. The drive typically collects between thirty and forty LEGO kits each year, providing STEM activities to kids staying in the Ronald McDonald House.

Through this event, we worked towards our long-term goal to "serve our community through giveback activities" through working to ensure that we participate in "4145 hours of active community outreach work within or beyond the Worthington community," one of our indicators of success for this long-term goal.

Turn for Troops

Purpose

To provide pens and handwritten letters to veterans participating in Honor Flights to thank them for their service to the United States of America and give them a memorable keepsake from their trip.

Event Description

Annually, we attend the "Turn for Troops" event hosted by Woodcraft, which is a store that holds these events as a partnership with the Honor Flight organization as well as others focused on supporting veterans and individuals actively in the military. Each member of our team turns pens with guidance from the workshop leaders there, then writes handwritten letters to the veterans going on Honor Flights to thank them for their service and contribution to the country. From there, these pens are packaged and sent on flights throughout the year.

Through this event, we worked towards our long-term goal to "serve our community through giveback activities" through working to ensure that we participate in "4145 hours of active community outreach work within or beyond the Worthington community," one of our indicators of success for this long-term goal.

Habitat for Humanity

Purpose

To use our large team size and experience working with tools and fabrication to make a positive impact on our community by restoring and supporting efforts for homes in need for those in Columbus.

Event Description

As a team, we worked on a project run by Habitat for Humanity in which we restored and helped repair the outside of a home. We worked on the area near the sidewalk—planting plants where there was dead grass and few living plants. We also worked on planting bushes and trees to surround the new home as opposed to soil without vegetation or grass backing up to it. Furthermore, we worked on removing dead plants and weeds from the area as we were replanting to ensure that there was opportunity for the new plants to thrive and continue growing when the home was in use.

Through this event, we worked towards our long-term goal to "serve our community through giveback activities" through working to ensure that we participate in "4145 hours of active community outreach work within or beyond the Worthington community," one of our indicators of success for this long-term goal.

Worthington Resource Pantry Drives

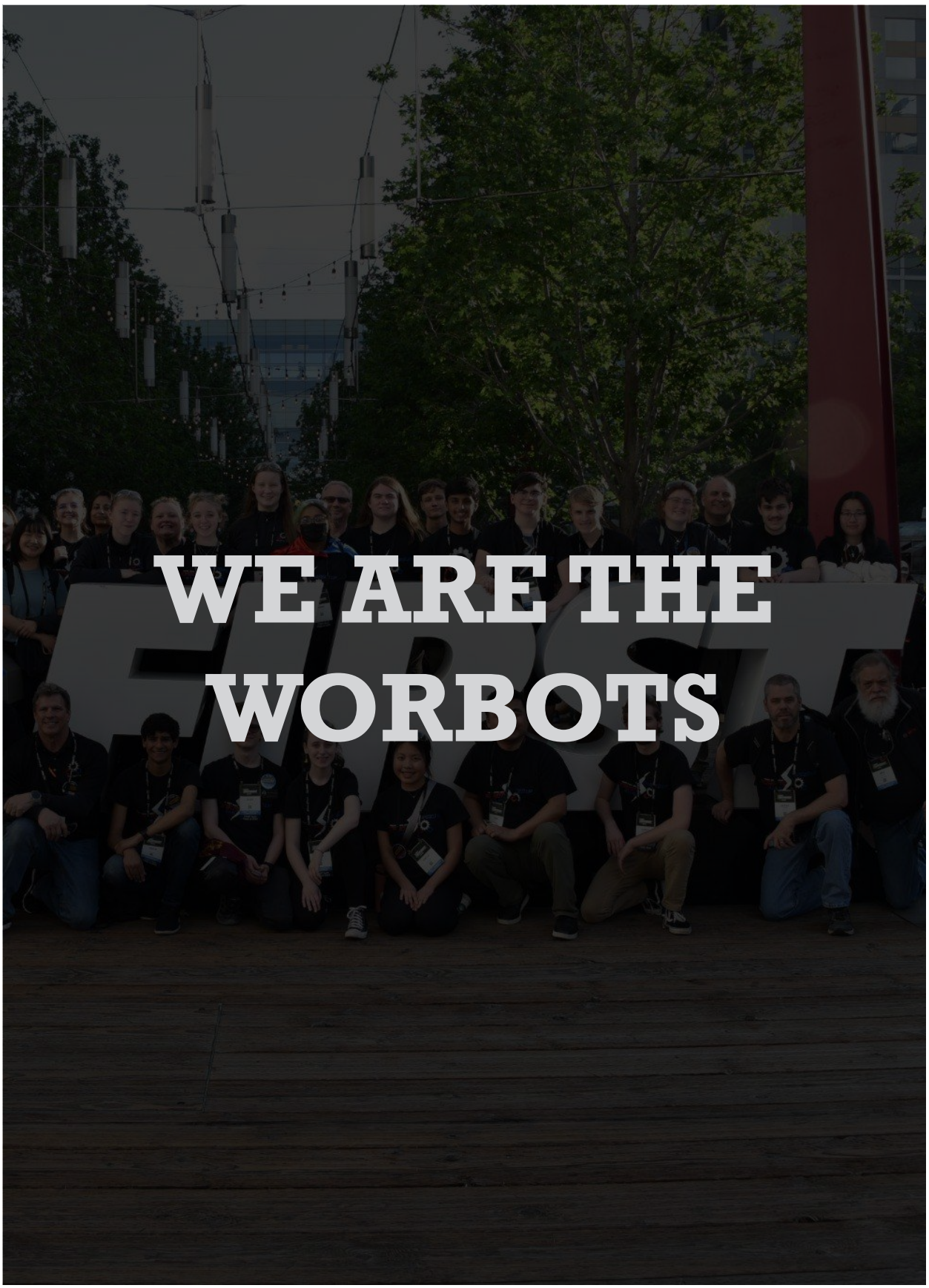
Purpose

To support members of the Worthington community by ensuring that all families have the necessary resources—food, hygiene products, and basic wellness items—to thrive and succeed within our community.

Event Description

At both of our high schools, we regularly run drives for the Worthington Resource Pantry based on needs they are communicating at that point in time. Typically, this includes collecting canned and non-perishable food items, soap, shampoo, conditioner, baby formula, toothbrushes, and hair brushes. By running these drives at both schools, we ensure that we can collect as many resources as possible for the Worthington Resource Pantry. We typically collect between fifty and ninety items between both high schools and run drives once per semester.

Through this event, we worked towards our long-term goal to "serve our community through giveback activities" through working to ensure that we participate in "4145 hours of active community outreach work within or beyond the Worthington community," one of our indicators of success for this long-term goal.


WE ARE THE
WORBOTS

Team Information

Mission Statement

Our mission is to cultivate a culture of STEM in Worthington, Ohio through:

- **Engaging** the community through our STEM and non-STEM outreach
- **Inspiring** future generations of lifelong STEM learners through our constantly improving cohesive K-12 pathway while increasing retention and diversity in STEM fields
- **Impacting** our community through giveback activities and contributing to the workforce with our growing internship programs

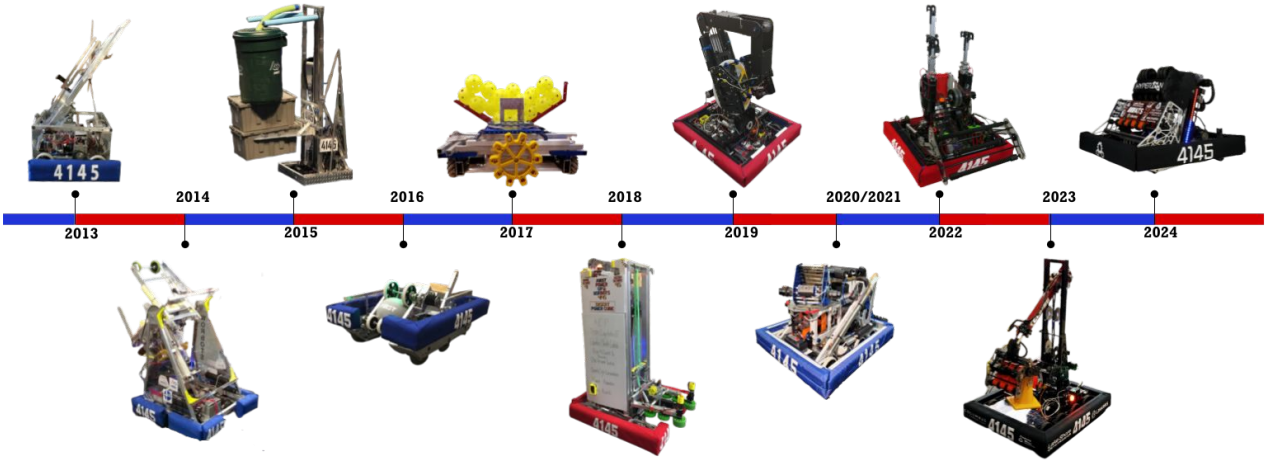
WorBots Core Values

- Innovation
- Education
- Inspiration
- Initiative
- Teamwork
- Professionalism

Team Summary

Founded in 2012, the WorBots are dedicated to cultivating a culture of STEM in Worthington, Ohio by engaging, inspiring, and impacting our community. Starting with a single team of less than twenty students and local STEM opportunities limited to the high school level, we set our sights on a *FIRST* pathway inspiring youth and impassioning them about STEM education. We have since developed the Worthington *FIRST* Pathway, including over 100 students across 3 FLL, 1 FTC, and 1 FRC team. We start and fund every Worthington *FIRST* team to ensure students in these schools have a sustainable access point to STEM, and we provide student mentors who serve as role models.

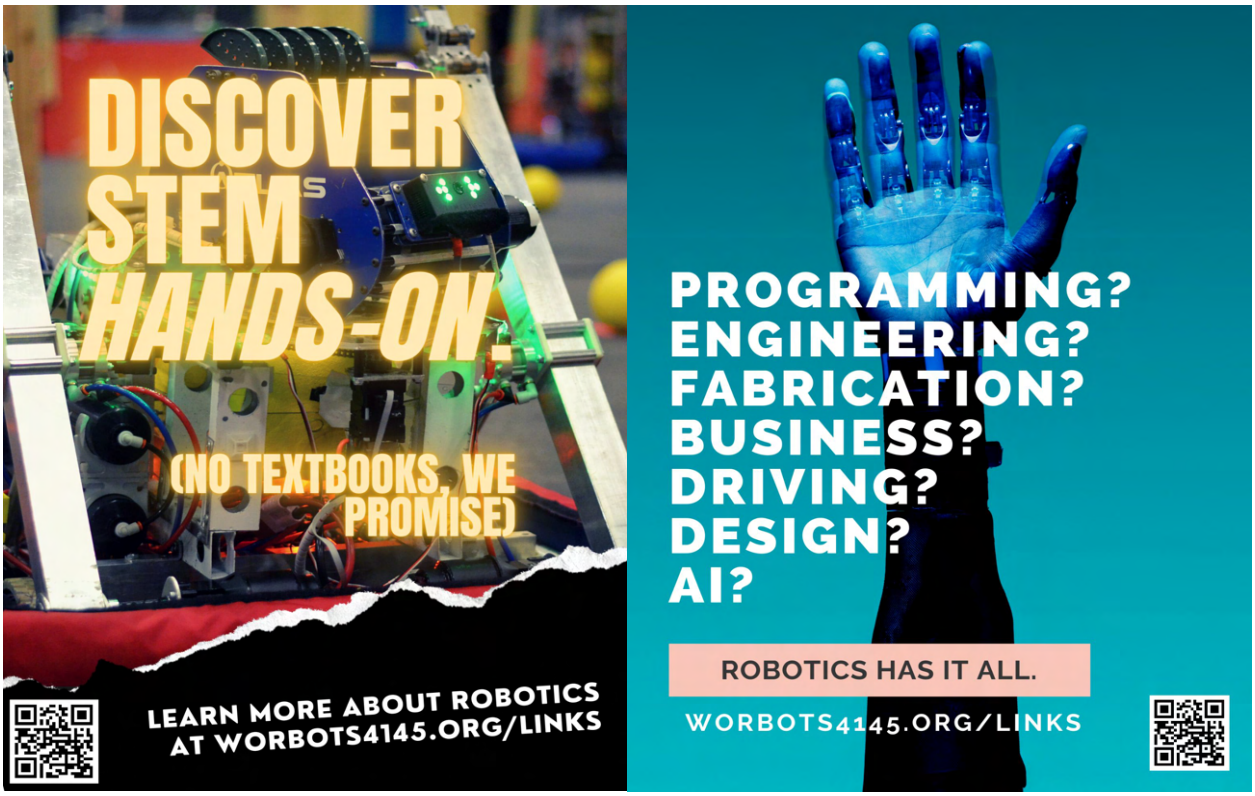
We further share a STEM fervor throughout our small community by connecting youth with STEM hands-on. Through nearly fifty events annually, we allow STEM knowledge, energy, and confidence to flourish. In Worthington, through Columbus Crew Games, local library events, Worthington Market Day, tours, demonstrations, and many other events, STEM and *FIRST* are now ubiquitous. We also focus on using STEM to impact the world around us from printing face shields at the height of the Covid-19 pandemic to annually donating LEGO kits to Nationwide Children's Hospital.



Worthington *FIRST* Pathway Recruitment

For the WorBots, a crucial part of cultivating a culture of STEM in Worthington, Ohio is making *FIRST* involvement opportunities loud within our community. We amp up kids in Worthington through demonstrations at Care After School (CAS) programs, local elementary school science days, Worthington Science Day, and Worthington Market Day—invigorating youth about STEM opportunities now and ahead of them. We also run events such as elementary and middle school workshop tours, workshops and local libraries, and engineering and design challenges, connecting youth with interactive STEM opportunities hands-on. Furthermore, we volunteer as camp counselors for the Worthington Gateway to Technology Camp, connecting youth with STEM learning. These events bring the majority of our feeder pathway students to *FIRST*. This season, we ran 60+ community outreach events, connecting students across our community with STEM education opportunities through *FIRST*.

For recruitment to the high school level of our program, we partner with Project Lead the Way (PLTW) and Entrepreneurship Business Academy (EBA) teachers as well as the chairs of each department to connect interested students with opportunities through *FIRST*. In Project Lead the Way classrooms, we present the connections between classroom knowledge they're gaining and opportunities through *FIRST*. In Entrepreneurship Business Academy (EBA) classrooms, we discuss the administrative aspects of *FIRST* and skill development that is applicable to their future careers in business administration, sales, or marketing. Department chairs coordinate advertisements in all classes throughout our schools. Less-directly, we have posters throughout both schools, appear regularly in the student/staff newsletter, and participate in student new segments.

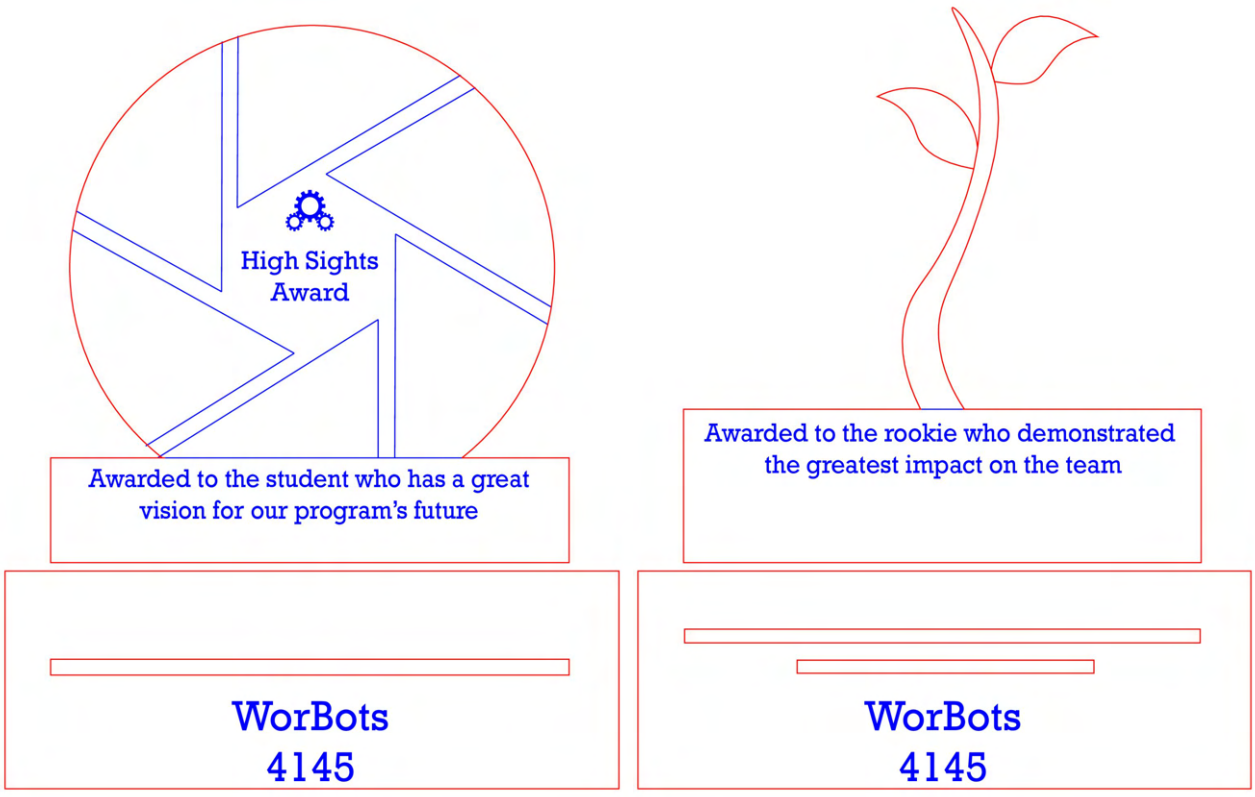


Member Contribution Recognition

Recognizing members of our team as well as mentors who make an outstanding contribution to our team is vital to our team sustainability. In order to recognize outstanding students and mentors, we design specialized awards which we present at team dinners. We also provide awards such as "Rookie of the Year" and "Future Lead" at our end-of-year banquet—celebrating dedication and commitment throughout the season. At team dinners, we further work to recognize contributions to the team by handing out specialized, seasonal awards such as the "High Sights" award for a student who took the initiative to lead our work with vision subsystems, elevating our team and robot. We also have highlights of each competition day at team dinners led by our team presidents, where we highlight the accomplishments of students on the team and the positive moments of the day.

We nominate involved sophomore and junior students who have exemplified dedication to the success of the team across all areas of operations for the *FIRST* Dean's List Award to recognize their contribution to our team and high quality leadership of our program within the *FIRST* program. We also nominate mentors who are chosen by the students for their impact on student learning for the Woodie Flowers Award to thank them for their contribution and dedication to our team.

At the annual Worthington *FIRST* Banquet, we highlight the accomplishments of students on all of our teams—*FIRST* LEGO League through *FIRST* Robotics Competition. We discuss individual students nominated by their mentors as well as teams as a whole, showing students that their contributions and successes are truly valued within the Worthington *FIRST* Pathway.



New Member Training

The WorBots are dedicated to ensuring that every student has the opportunity to learn and succeed on our team. As new members join the team, they begin our rookie training program, often referred to as "rookie 'bots." New members select a subteam of interest, though this may be changed at any time, and temporarily break into rookie subteams—lead by the student leads of the corresponding WorBots subteam. Further, we pair each new student with a returning student, ensuring that all team members are connected and that they can ask questions as they arise.During a six-week period, the rookie subteams work to develop CAD, fabrication, programming, public speaking, and formal writing skills as they produce an FRC-style robot and sustainability presentation in partnership with student leadership and mentors. Each skill is developed through a series of "crash courses," focusing on specialized skills. Through this program, we ensure that prior experience or coursework does not serve as an impediment for STEM-interested students.

By having returning and new team members work together while rookies move throughout the aspects of training, they **develop relationships**

By working through a technical challenge in a short span, new technical members **develop STEM knowledge and confidence**

Through working with one another throughout rookie training, our program **fosters a sense of teamwork** between all WorBots.

Week 1
All new students are introduced to the principles and history of the team. Technical students are introduced to the challenge, while business students work on a more in-depth version of the team overview and begin a presentation assignment.

Week 2
Students get to know their subteam leads and returning members as they progress throughout the challenge given. Technical team members finalize the design process at this point and move onto prototyping. Business students work on presentations.

Week 3
Technical students finish prototyping and move onto either fabrication or programming. Business students finish their presentations and get structural feedback. All students are expected to have joined the Discord server.

Week 4
Technical students carry on with work in their respective subgroup. Subteams should be one-third of the way done. Business rookies begin presenting their presentations to returning members and getting feedback from the business team.

Week 5
Fabrication students finish building the rookie bot to pass it on to the programming students. Programming students finalize the code they were able to work on before getting the robot. Business students run their final presentation and work on mock sponsorship calls.

Week 6
Programming students finish working on the rookie bot and we run a "robot reveal" for the rookie robot. Business students participate in a sustainability presentation. All rookies should apply for the team on the *FIRST* website at this time.

Financial Plan

The WorBots work to ensure financial sustainability by building a reserve fund in the event that sponsorships are not seasonally retained and, therefore, cannot fund all necessary seasonal costs. To maintain this fund, we work to add a total net income between ten and twenty thousand dollars. To ensure that we fall within this range, we maintain sponsor relationships throughout the season with invitations into our shop, emails updating our sponsors during the season, annual presentations, and post-competition summaries, including photos, discussion of any awards won, our ranking, and match videos. Internships with two of our key sponsors, ATS Automation and Lake Shore Cryotronics, connect them with our alumni.

To decrease team expenses, the WorBots work to build relationships with parts and service companies; these sponsorships provide free or reduced costs for plastics and aluminum or waterjet cutting and CNC milling services, as we do not have the capability to do either in our workshop space. Some of these sponsors joined us at our kickoff event, allowing them to see what the team would be working on for the season as well as meet our team members.

Our largest non-sponsorship fundraising effort is the Wolfpack Gymnastics Invitational. Each January, the WorBots assist the Worthington Kilbourne gymnastics team in the hosting all-Ohio meet through setup, tear-down, timing, and scoring through the event. Additionally, the WorBots run a concession stand throughout the two-day event. We also run candy bar sales where students sell candy as a way to fundraise for the WorBots. We further fundraise through restaurant fundraisers such as Chipotle and City Barbeque as well as corporate match programs.

While each student is expected to participate in the fundraising activities, the team offers scholarships and provides transportation and hotels to competitions for those in need. When we qualify for the World Championships, we ensure that students have the resources they need to travel with us and share the experience of the global *FIRST* community. We ensure every student has an opportunity to be part of the WorBots no matter their financial means

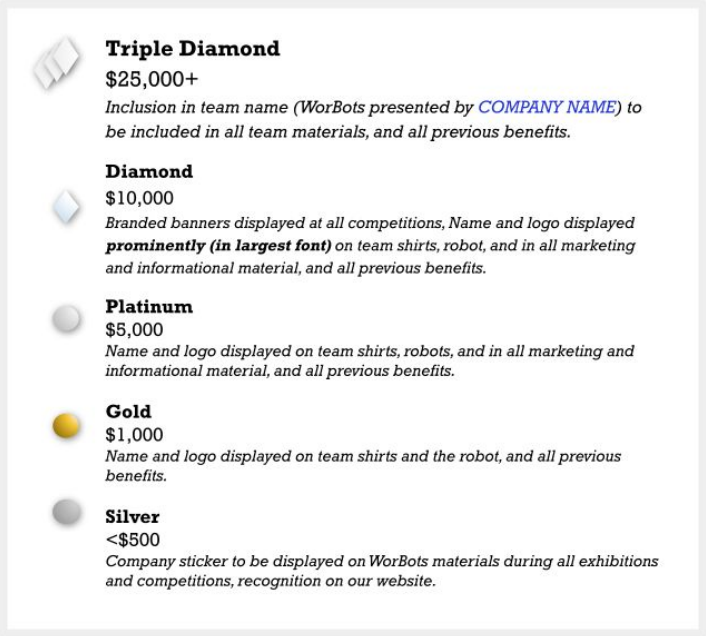
In the past three seasons, the aforementioned methodology has resulted in a fund able to sustain operations for over one season without any revenue, and two seasons when team fees are accounted for as a constant source.

Corporate Sponsorships

The WorBots officially begin the fundraising season during May each year. Members of the marketing team research companies, prioritizing not only potential monetary sponsors, but service and parts sponsors that reduce expenses. As part of our fundraising efforts, we connect with companies through three common interests:

- Supporting the community
- Building a pathway for future employment
- Increasing public awareness of their company

The WorBots initiate this process by sending letters and emails as well as cold calling companies, with the goal of securing an in-person meeting. At an initial meeting, members give a brief presentation of the *FIRST*® program, team accomplishments, and sponsor benefits. Sponsor benefits include 501(c)(3) tax deductions, and the aforementioned common interests. Sponsor benefits vary based on level.



Triple Diamond
$25,000+
Inclusion in team name (WorBots presented by COMPANY NAME) to be included in all team materials, and all previous benefits.

Diamond
$10,000
*Branded banners displayed at all competitions, Name and logo displayed **prominently (in largest font)** on team shirts, robot, and in all marketing and informational material, and all previous benefits.*

Platinum
$5,000
Name and logo displayed on team shirts, robots, and in all marketing and informational material, and all previous benefits.

Gold
$1,000
Name and logo displayed on team shirts and the robot, and all previous benefits.

Silver
<$500
Company sticker to be displayed on WorBots materials during all exhibitions and competitions, recognition on our website.

Once a new sponsor has been acquired, the WorBots invite them into our workshop for a tour and to meet our members. It is essential that we express our gratitude for their contribution and have them see our team in action.

During the 2023-2024 Crescendo season, the WorBots had seventeen corporate sponsors and five private donors. Our sponsors Lake Shore Cryotronics and ATS Automation both met with us in our shop to see our progress as a team and provide professional advice in 2022. In 2023, they visited our shop again for a shop tour and discussed internships with our team members.

One of our focuses is maintaining sponsor relationships seasonally. To ensure this, we maintain contact and communication through email updates, sponsorship renewal letters, and in-person meetings. Sponsor relationships are further strengthened through team alumni acting as interns.

Income

2023-2024 Income	
Sponsors	**$27,000.00**
L3 Harris	$2,500.00
Lake Shore Cryotronics	$5,000.00
The Electric Connection	$500.00
ATS Automation	$10,000.00
JP Morgan/Chase	$2,000.00
Safelite Grant	$2,000.00
AEP Grant	$5,000.00
Restaurant Fundraisers	**$1400.00**
Chipotle	$1000.00
City BBQ	$400.00
Other	**$17,700.00**
Private Donations	$4,000.00
Wolfpack Gymnastics Invitational	$3,000.00
CORI Concessions	$700.00
Team Fee	$4,000.00
Total Income:	**$40,100.00**

Expenses

2023-2024 Expenses	
Greater Pittsburgh Regional	$3,000.00
Buckeye Regional	$3,000.00
Miami Valley Regional	$6,000.00
Robot	$7,000.00
Team Meals	$3,000.00
Practice Field	$1,000.00
Team Merch	$1,000.00
Feeder Programs	$1,400.00
Total Expenses	**$25,400.00**
Net Income	**$14,700.00**

Strategic Plan

Before each season, the WorBots discuss successes and challenges from the previous season. These are compiled into lists to guide our off-season team development. Outcomes of the previous season also help us determine our strengths, weaknesses, opportunities, and threats as well as our next steps to maintain sustainability.

Strengths	Weaknesses
☼ Financial accessibility ☼ Recruitment ☼ Sponsor retention ☼ Community outreach ☼ Strong FRC relationships	☼ Minimal teacher involvement ☼ Community giveback ☼ Social media presence (outside of Instagram)
Opportunities	**Threats**
☼ School board relationship ☼ Local business relationships ☼ Feeder pathway ☼ Mentorship from sponsors	☼ Longevity of our training program ☼ New lead mentor

Strengths

The WorBots have developed a program designed to ensure that all students have access to STEM through FIRST®. To do this, we offer scholarships to students who cannot afford team fees. We exponentially increased our recruiting efforts within our second school by presenting to all of the PLTW classes and ensuring that business students learn about the non-technical aspects of the team. Part of this also comes from our outreach events, which have inspired many students and community members to get involved with STEM. Furthermore, we have strong relationships with both sponsors and FRC teams that help us to succeed.

Weaknesses

One of the WorBots' current weaknesses is involvement from teachers within our school. While we have made efforts to improve this through presenting to TWHS PLTW classes, most of our team's mentors do not work at Worthington Schools. Along with this, we have a low number of mentors, which we are trying to combat by contacting returning sponsors to engage them through mentorship. Furthermore, we have limited presence on almost all social media platforms, and we are looking to expand seasonal participation in giveback activities.

Strategic Plan

Opportunities

The WorBots have many opportunities to further expand our program. One area is our relationship with our school district. We have worked to expand our partnership through meetings and presentations, and we are looking to continue expanding this relationship as both high schools are re-done to ensure that STEM opportunities in Worthington continue to grow. Through our consistently-growing feeder pathway, we are expanding beyond our FRC level and encouraging young students to expand STEM knowledge.

Threats

The WorBots seasonally identify threats in order to ensure that we are sustainable. One of our biggest identified threats is a longevity of succession planning because members typically reach leadership positions within their last year on the team, causing seasonal rotation of leads. To mitigate this, we are maintaining our training program and implementing more meticulous documentation practices to ensure that team members are prepared each season and we don't face seasonal knowledge loss. Another identified threat is that our head coach is new to coaching. To help him manage new tasks, student leadership is increasing the amount they manage operationally.

Season Goals

At the beginning of each season, in response to documented lessons learned, the team mission, and reasonable progression, the WorBots work to develop seasonal goals. These goals are referenced throughout the season to ensure that the team continuously improves. For the 2023-2024 season, our goals are as follows:

- Retain sponsors from the 2022-2023 season
- Start two new feeder programs
- Mentor all four feeder programs
- Qualify for the *FIRST*® Championship
- Complete two new giveback activities
- Develop a more cohesive team brand

Long-Term Goals

With the mission of cultivating a culture of STEM in Worthington, Ohio, the WorBots have developed specific goals and paired them with indicators of success to ensure consistent team development and impact on our community. These goals are worked toward through various events, program revisions, projects, and meetings; then, the success is documented in our outreach plan. This plan analyzes each event in terms of measurable results, reach, and growth from previous seasons — allowing us to regularly improve upon and audit our work on the team and in our community.

Long Term Goals

Goal	Time	Indicators of Success
Develop high retention of students from elementary school to high school robotics programs.	Five years	☼ At least 80% of elementary school robotics program students join FRC teams. ☼ All feeder team students have the opportunity to connect to WorBots annually
Expand the presence of *FIRST* within Worthington and Worthington City Schools.	Two years	☼ Every school has an FLL/FTC team. ☼ Run or participate in at least 3 whole-community events seasonally. ☼ Run or participate in events at all schools — regardless of feeder team status.
Develop a training system that improves team succession and consistently gain new members.	Three years	☼ Returning students feel prepared to enter each season. ☼ 90% rookie retention. ☼ At least three students per subteam obtained and retained.
Mature our relationship with the SWE Next group within both schools.	Two years	☼ 10 members join from that program. ☼ 2 or more events with them annually.
Develop cohesive team social media and website branding and management.	Two years	☼ 500% increase in social media engagement. ☼ Communication is consistent on all social media. ☼ Have consistent graphics in all media and publications.
Develop a resource library for incoming team members to prevent information loss.	Yearly effort	☼ Have all produced resources available through the website. ☼ Document all technical changes to ensure sustainability.
Sustain and grow the rainy day fund to ensure team sustainability.	Two years	☼ $35,000 rainy day fund available consistently at the end of each season.
Mature partnerships with businesses, schools, and educational institutions.	Four years	☼ Retain machine shop and sponsor relationships ☼ Have 5 members of the Worthington City School Board in our shop annually. ☼ Reach groups beyond our small community and maintain means of doing so.
Maintain development data and statistics.	Yearly effort	☼ Have all statistics available in the Master Folder. ☼ Have statistics for each season.
Strengthen partnership at TWHS to retain members from both schools.	Five years	☼ 5 consecutive seasons of equal membership between schools.
Serve our community through giveback activities.	Three years	☼ 4,145 hours of active community outreach work.

Long Term Goal Descriptions

Develop high retention of students from elementary school to high school robotics programs

As a part of our mission to cultivate a culture of STEM in Worthington, Ohio by engaging, inspiring, and impacting our community, we believe it is imperative that youth in our community are excited about STEM and consistently accessing STEM education opportunities through the Worthington *FIRST* Pathway. Through working toward high retention, we are moving past supporting individual teams to supporting a cohesive pathway that is changing the tide of STEM education in Worthington. The timeline we have identified for this goal is five years, with this being the second year since implementation.

To determine our success with the goal of developing high pathway retention, we have two primary indicators of success. First, we believe that "high retention" is defined by at least eighty percent retention of students participating in the Worthington *FIRST* Pathway, as this provides some variability while ensuring the majority of students remain involved in the pathway. The second indicator of success for this goal is that all feeder team students have the opportunity to connect with the WorBots annually. We believe that young students seeing and connecting the the older levels of the Worthington *FIRST* Pathway promotes excitement about STEM opportunities and encourages kids to continue on in their involvement.

Expand the presence of *FIRST* within Worthington and Worthington City Schools

As a part of our mission to cultivate a culture of STEM in Worthington, Ohio by engaging, inspiring, and impacting our community, we believe it is imperative that youth in our community are excited about STEM and consistently accessing STEM education opportunities through the Worthington *FIRST* Pathway. Through working to develop teams throughout the school district, we working to expand into a cohesive pathway that is effectively impacting the entire Worthington community and exciting people locally about STEM through *FIRST*. The timeline we have identified for this goal is two years, with this being the second year since implementation.

To determine our success within this the goal of expanding the presence of *FIRST* within Worthington and Worthington Schools, we have established three key indicators of success. First, we aim to have a feeder team in every single Worthington School. This ensures that students can connect to *FIRST* locally without having to travel across the district, making learning through STEM more accessible. Second, we are working to run or participate in at least three whole-community events annually in order to reach community members of all ages and backgrounds to highlight the impact of student learning through the *FIRST* program. Third, we are working to run or participate in events at all schools, regardless of feeder team status. By doing this, we are ensuring that students have access to fun and engaging STEM education opportunities that will excite them about their STEM learning within the *FIRST* Pathway and beyond.

Long Term Goal Descriptions

Develop a training system that improves team succession and consistently gain new members.

With a consistent gain in team membership and involvement, it is imperative that we consistently encourage students to get involved with STEM and robotics regardless of prior experience at the highschool level. As such, we are working to implement a strong rookie training program which can develop all skills used throughout the WorBots—ensuring that students lacking previous experience can still participate equally and enjoy all *FIRST* has to offer. This training is further imperative to bridge the gap in knowledge between senior members of the team and newer members, ensuring smooth succession of team members. The timeline we have identified for this goal is three years, with this being the second year since implementation.

To determine our success with this long-term goal, we have implemented postseason surveys for all new members of the team where they can submit information regarding how much they feel they have learned and how prepared they feel for the following season, with one indicator of success being high rates of preparedness reported by younger students. The second indicator of success is high rookie retention as indicated by ninety percent of students returning to the team following the completion of their rookie season on the WorBots. Through focusing on keeping rookie members involved, we are ensuring that knowledge is continuously passed down and that new team members are envisioning themselves on the team long-term. Third, we are working to obtain and retain three new members per subteam, ensuring students are learning new material and that there are students informed about every aspect of the team.

Mature our relationship with the SWE Next group within both schools.

We are consistently focused on ensuring that STEM is reaching everyone in our community and that we are representing all. As such, it is important to our team that we connect with groups dedicated to bridging gaps between women interested in STEM and STEM learning. We have an ongoing relationship with the SWENext programs at both high schools, ensuring that women interested in engineering and STEM fields know about extended STEM learning opportunities through the *FIRST* program. While we already work with these programs, we are looking to expand this relationship in order to ensure that *FIRST* is connecting everyone in our community and that there are not barriers between women in our community and STEM opportunities that will help them succeed long-term in their future education and careers. The timeline we have identified for this goal is two years, with this being the second year since implementation.

To ensure that we are effectively fostering a strong relationship between the WorBots and SWENext programs as Thomas Worthington High School and Worthington Kilbourne High School, we have determined two indicators of success. First, we are looking for ten or more students to join our team from that program, demonstrating a strong connection and promotion of STEM-focused extracurriculars to group members. Second, we are looking to establish two or more events with them each season, ensuring that women interested in engineering can get involved with the program and connect with STEM opportunities into their futures.

Long Term Goal Descriptions

Develop cohesive team social media and website branding and management

In order to ensure that we are consistently sharing the impact of *FIRST* on our students to the Worthington community and that we are effectively communicating within the *FIRST* community, we are working to increase our involvement with our social media platforms as well as our website. These platforms provide communication with everyone our team would reach—local community members, *FIRST* community members, and potential sponsors—with information regarding our team and its day-to-day operations. The timeline we have identified for this goal is two years, with this being the second year since implementation. Most recently, we redesigned our entire website, making our team resources, information, and contact sources easier to access and further match our brand.

To determine our success with the goal of developing high pathway retention, we have three primary indicators of success. First, we are working to develop a 500% increase in engagement across our social media platforms, which will indicate that we are effectively spreading our message and sharing content with others. Second, we are working to even out the usage of our social media platforms so that all information is shared on every appropriate platform each time it is communicated. This ensures that the different audiences using each platform are all receiving adequate information about our team and team's involvement within our community.

Develop a resource library for incoming team members to prevent information loss

In order to ensure that all team members have all information that they need to succeed, we believe it is imperative that we provide information regarding previous team operations and how we managed ourselves and our time in order to effectively produce a robot, code, and all needed secondary competition materials within the timeframe we were working with. We also provide information regarding the lessons we learn from competitions and the resources we have available to us. Furthermore, we are working to further document specific procedures, to ensure new members have the knowledge they need to succeed during the fast-paced build and competition seasons. We determined this goal is a yearly effort for our team to improve upon and develop new resources as our operations evolve.

To determine and maintain our progress within this goal, we have identified two indicators of success. First, we determined that it is important for all team resources to be made available through our website, as this ensures they can be accessed with ease from year-to-year, even before team members gain access to our resources on our website. Second, we determined that it is important to document all technical changes we made throughout the season to ensure that mistakes of previous seasons are taken advantage of as learning opportunities for our team.

Long Term Goal Descriptions

Sustain and grow the rainy day fund to ensure team sustainability

In order to ensure we can continuously sustain all of our team operations as well as our consistent community impact, we are working to maintain a rainy day fund that is able to sustain our team, team operations, and related team costs for one season in the absence of sponsorship. This is implemented to uphold year-to-year operations and ensure both our team and dependant programs are not at risk in seasons where fundraising efforts are unsuccessful. The timeline we have identified for this goal is two years, with this being the second year since implementation.

To ensure that we are consistently meeting this long-term goal for our team's sustainability, we have determined one indicator of success. We are working to develop a 35,000 dollar rainy day fund and sustain this across two seasons. Through doing this, we are ensuring adequate preparation for any shifts in our funding sources.

Mature partnerships with businesses, schools, and educational institutions.

To cultivate a culture of STEM in Worthington, Ohio, it is imperative that we hold strong community relationships. As such, we are working to strengthen our relationships with the Worthington City School Board, local businesses, and both Worthington high schools, ensuring that there are accessible STEM opportunities and support systems in place for them. Furthermore, we are looking to develop roots in the broader Ohio community, which we are doing through The timeline we have identified for this goal is four years, with this being the second year since implementation.

To ensure that we are consistently meeting this long-term goal, we have three indicators of success. First, we want to retain shop and sponsor relationships in order to reduce team costs and ensure that we have connections with those holding engineering expertise, as that is often passed down to our students through community events. We also are working to have five members of the school board in our workshop annually, ensuring consistent STEM opportunities and connection with leadership locally. Third, we are working to reach groups beyond Worthington to spread STEM far beyond our small community.

Maintain development data and statistics

In order to ensure we are most effectively reaching out to and impacting our community, we are looking to improve the data and statistics retained across all of our community outreach, including in-person events and the impact of our social media presence. We are working to implement this through more consistent documentation using a master form as well as consistent logging of reach for posts and social media accounts across each month. We have determined that this is a year-to-year goal, which was implemented two years ago.

To ensure that we are consistently working toward this goal, we have defined two measures of success. First, we are requiring that all outcomes of outreach are held in our master folder containing images, resources, and materials from that event—ensuring that data from events can be maintained from year-to-year and accessed by students who may not have attended the event. Second, we are requiring that statistics regarding the team and the team's efforts are required each year, ensuring that there is a basepoint of information.

Long Term Goal Descriptions

Strengthen partnership at TWHS to retain members from both schools

In order to effectively spread STEM within our community, it is important that we are connecting students from Thomas Worthington High School and Worthington Kilbourne High School with STEM education opportunities through *FIRST*. Historically, because our team is run out of Worthington Kilbourne High School's building, we have experienced an extreme deficit in the number of students participating from Thomas Worthington High School, reducing a connection with a significant portion of students within our district. By working to bridge this gap, we are hoping to ensure that STEM is more represented throughout our district and expand our feeder program. The timeline we have identified for this goal is five years, with this being the second year since implementation.

We determined that there is one indicator of success for this long-term goal—equal membership between both high schools for five seasons. Through working to maintain consistent, equal membership, we are ensuring that both schools are represented through our team and that we are effectively impacting students across the Worthington City School District.

Serve our community through giveback activities

Beyond reaching our community by connecting STEM opportunities, we believe it is imperative that we use our STEM skills to give back to our community. As such, we are focused on working with initiatives in our community that are giving back to those in need. Through participating in these events, we are forging a connection between STEM and tangible changes in the world around students, encouraging them to carry on the value of giving back to their community. The timeline we have identified for this goal is three years, with this being the second year since implementation.

We determined that there is one indicator of success for this goal. We are working to complete 4145 hours of community giveback activities in order to consistently support members of our community and ensure they have the resources they need to succeed.

Worthington Schools Presentations

Each year, we invite the Worthington City School Board into our workshop to unveil our new robot for the season. During this event, we also speak about the development of STEM education in Worthington City Schools and discuss ways in which the school district can uplift STEM education opportunities. The following is a sample of the presentation we give before revealing the robot.

School Board Meeting Speech on STEM

Hello, everyone. My name is Natalie Diebert, and I am a sophomore from Thomas Worthington High School. I am a member of the Worthington Robotics Team, also known as the WorBots. I am joined by my teammates Braylee Hsu and Marano.

In the past thirty years, STEM employment has increased by over eighty percent (Pew Research Center). This growth will not stop. Within the next ten years, the Bureau of Labor Statistics estimates that over eight hundred thousand STEM jobs will open across America, yet STEM education is not expanding to accommodate this. Within Ohio, these statistics are only becoming more relevant. As Intel becomes a keystone for the local job market in Central Ohio, it is imperative to support all students interested in STEM careers throughout the Worthington School District.

As a member of the WorBots, I have seen the impact our program has had on myself and my peers. We are a part of an international program called FIRST — For the Inspiration and Recognition of Science and Technology — which engages students from all backgrounds. The level I'm involved with, the high school program, gives students the chance to work together to design, prototype, build, and program a robot in only six weeks to then compete against 180 other teams from around the world. This season, the robot used AI vision targeting to track, intake, and shoot balls into an over eight-foot-high basket in addition to climbing and traversing four bars (similar to the monkey bars). Working through the engineering design process in such a short period of time provides an experience parallel to that of professionals working in the STEM industry. This hands-on experience allows them to apply what they learned in the PLTW classroom and prepared ninety-two percent of our team's alumni as they pursued STEM careers. These opportunities start in elementary school, where students can also gain exposure to fundamental STEM concepts by creating smaller robots with guidance from the high school team. And they do not stop, with these opportunities moving up to middle school, and then high school.

As you consider redesigning the schools, it is crucial to consider how the new design impacts student's education. Whether it be at Thomas or Kilbourne, having additional space and equipment would be pivotal in creating both a killer robot and the future of STEM education in Worthington. As a community, we have the opportunity to make the next step, take our education to the next level, and expand our students' futures.

Thank you.

Alumni Internships with Sponsors

Braylee H.

After meeting employees of Lake Shore Cryotronics when they visited our shop, I became interested in the connections between business administration and engineering even outside of *FIRST*. After my senior year, I began an internship with Lake Shore where I worked with business administration and management, solidifying my goal in working with business and marketing for STEM companies professionally. I regularly used skills such as making cold calls or managing large, long-term projects working with Lake Shore. I was able to work with engineering and marketing interns, which helped me to develop a well-rounded understanding of how companies holistically operate. In the future, I hope to use these skills to run a business and succeed in the corporate sphere.

George F.

Being a WorBot made finding a freshman summer internship so much easier. Using the technical knowledge and marketing skills I had developed from FRC, I found it easy to professionally engage with ATS Ohio and secure a controls engineering internship over the 2023 summer. Controls engineering is a type of software engineering that typically involves programming using Ladder Logic or Structured Text, which are languages that were built to be accessible to electrical engineers and maintenance technicians. In my time at ATS, I worked on a team with full-time engineers to program real projects for ATS's customers. Thanks to the WorBots I can demonstrate to future employers that I was able to compete with degree-holding engineers even as a student out of their first year of college. In the future, I plan to continue exposing myself to other subfields of computer science, contribute to academic research, and eventually return to teach students (and mentor my own FRC team)!

Alumni Internships with Sponsors

Mark F.

I became interested in working at PATH Robotics after participating in a tour of their facility with the WorBots my first year mentoring, as it was a fusion between my passion for computer vision and educational goals moving forward. Working there, I focused on camera calibration and sensor quality control. I also frequently use ROS, which I was first introduced to through participating in the WorBots. In the future, I am planning to expand further into working with computer vision solutions for drones. I also intend to continue as a mentor for my former FRC team, the WorBots, and continue to work with the computer vision subteam of the programming team.

Phillip W.

I currently work with one of our sponsors, Lake Shore Cryotronics, in firmware engineering. I was introduced to the company as one of our sponsors when they brought in their engineering department to do a shop tour and had talked with the manager at length about the similarities between what we did in our shop and what they did in industry. After talking and a few emails, I was offered a tour of their offices and the an internship shortly after. This involved me working on prototypes for various new product lines including low temperature monitors used in cryogenic environment control and a full-time employment offer continuing my work into the future. I'm now looking to continue working on my new project of a general purpose cryogenic controller. I intend to remain a mentor for the WorBots with the programming subteam.

MAKING THE
GEARS TURN

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
STEM Fair - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	300
Worthingway Middle School STEM Night - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
Kilbourne Shop Tour - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	20
Middle School Robotics Competition - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	75
McCord Shop Tour	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
Bluffsview Elementary Science Night - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	200
Worthington School Board Meeting - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	70
Provided Published Resources - Robot Code	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	200
Provided Published Resources - Vision Code	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	250

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
FIRST LEGO League Team 44451	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Every school has an FLL/FTC team.	10
FIRST LEGO League Team 44452	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Every school has an FLL/FTC team.	10
FIRST Tech Challenge Team 16284	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Every school has an FLL/FTC team.	20
FIRST LEGO League Team 44451	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10
FIRST LEGO League Team 44452	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10
FIRST Tech Challenge Team 16284	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	20
WKHS Football Game - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	1,200
CORI Invitational - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	3,000

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
FIRST LEGO League Team 44451	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10
FIRST LEGO League Team 44452	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10
FIRST Tech Challenge Team 16284	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	20
Science Day - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	100
Provided Published Resources - Robot Code	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	110
FIRST LEGO League Team 44451	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10
FIRST LEGO League Team 44452	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
FIRST Tech Challenge Team 16284	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	20
WKHS Freshman Orientation Robot Demonstration - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	500
Provided Published Resources - AI Vision	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	160
Provided Published Resources - Robot Code	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	90
FLL Robot Demonstration - Worthington, Ohio	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	20
Columbus Dispatch Article - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	6,000
Wilson Hill LEGO Robotics Club - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	10

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Published Business Resources	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	240
Published Recruiting Resources	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	240
Meeting with School District Officials for *FIRST* Support - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Have 5 members of the Worthington City School Board in our shop annually.	30
Meeting with Principals and the Directors of Primary and Secondary Education for Worthington *FIRST* Support - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Have 5 members of the Worthington City School Board in our shop annually.	30
Worthington Kilbourne Student News Segment - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	1,200
Thomas Worthington Student News Segment - Worthington, Ohio	Strengthen partnership at TWHS to retain members from both schools.	5 consecutive seasons of equal membership between schools.	1,500
Worthington Kilbourne Activities Fair - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	1,200
Bluffsview CAS Robot Demonstration - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	46

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
May 5th, 2022 Elementary School Shop Tour - Worthington Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	60
May 10th, 2022 Elementary School Shop Tour - Worthington Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	60
May 12th, 2022 Elementary School Shop Tour - Worthington Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	60
Olentangy Caverns Robot Demonstration Week 1 - Olentangy, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	33
Worthington Libraries LEGO Battle Bots - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	47
Olentangy Caverns Robot Demonstration Week 2 - Olentangy, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	35
School Board Meeting STEM Advocacy - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Have 5 members of the Worthington City School Board in our shop annually.	30
Germany *FIRST* Support	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	5

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Thomas Worthington Freshman Activities Fair - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	500
Worthington Kilbourne Freshman First Day - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	500
Demonstration for Freshmen PLTW Class 1 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
Demonstration for Freshmen PLTW Class 2 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
Thomas Worthington High School Newsletter	Strengthen partnership at TWHS to retain members from both schools.	5 consecutive seasons of equal membership between schools.	3,000
Thomas Worthington Student News Interview	Strengthen partnership at TWHS to retain members from both schools.	5 consecutive seasons of equal membership between schools.	1,500
Thomas Worthington Involvement Fair - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	1,500
POE Presentation 1 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
POE Presentation 2 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
POE Presentation 3 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
CAD Presentation - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
FIRST LEGO League Team 57154	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Every school has an FLL/FTC team.	10
FIRST Tech Challenge Team 16284	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	20
FIRST LEGO League Team 57154	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10
FIRST LEGO League Team 44451	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10
FIRST LEGO League Team 44452	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	10

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
FIRST Robotics Competition Team 6916	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	30
FIRST Robotics Competition Team 8856	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	20
Provided Published Resources - Robot Code	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	180
Provided Published Resources - ROS Path Generator	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Worthington Market Day - Worthington, Ohio	Expand the presence of FIRST within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	800
Worthington Middle School Shop Tour - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
CORI Invitational - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	3,000
Lake Shore Shop Tour - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Retain machine shop and sponsor relationships	20

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
ATS Shop Tour - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Retain machine shop and sponsor relationships	20
FLL Shop Tour - Worthington, Ohio	Develop a high retention of students from elementary school to high school robotics programs.	All feeder team students have the opportunity to connect to WorBots annually	40
Curriculum Night Presentation - Worthington, Ohio	Strengthen partnership at TWHS to retain members from both schools.	5 consecutive seasons of equal membership between schools.	500
Impower.ai Presentation - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Retain machine shop and sponsor relationships	15
Chipotle Presentation - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Retain machine shop and sponsor relationships	15
Merrill Lynch Presentation - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Retain machine shop and sponsor relationships	15
Safety Kits - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	250
Community Robot Reveal - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	70

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Worthington School Board Presentation / Robot Reveal - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Have 5 members of the Worthington City School Board in our shop annually.	30
Girl Scouts Event - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
AEP Article	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	5,000
Eagle Extravaganza Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	200
FIRST Robotics Competition Team 8091	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Worthington Kilbourne Pep Rally - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	1,200
Elementary School Shop Tour 1 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	20
Elementary School Shop Tour 2 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	20

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Elementary School Shop Tour 3 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	20
Middle School Shop Tour - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	10
Worthington *FIRST* Banquet - Worthington, Ohio	Develop a high retention of students from elementary school to high school robotics programs.	All feeder team students have the opportunity to connect to WorBots annually	90
FTC Workshop Tour - Worthington, Ohio	Develop a high retention of students from elementary school to high school robotics programs.	All feeder team students have the opportunity to connect to WorBots annually	10
Worthington School Board Meeting - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	70
Middle School STEM Camp - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	20
FIRST Robotics Competition Team 7565	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	25
Worthington Park Break Out the Alien Code Middle School Coding Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	15

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
FIRST Robotics Competition Team Krypton	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	30
FIRST Robotics Competition Team 7567	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	21
Worthington Park Family Fun Night Robots and Gadgets - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	30
Columbus Crew Game - Columbus, Ohio	Expand the presence of *FIRST* within Ohio as a whole	Run or participate in events reaching a broader audience within Ohio expanding beyond Worthington.	20,000
Thomas Worthington High School Involvement Fair - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	1,500
Introduction to Engineering and Design Presentation 1 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
Principles of Engineering Presentation 1 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
Principles of Engineering Presentation 2 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Principles of Engineering Presentation 3 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
AP Computer Science A Presentation - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
Introduction to Programming Logic Presentation - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
Introduction to Engineering and Design Presentation 2 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
Introduction to Engineering and Design Presentation 3 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
Introduction to Engineering and Design Presentation 4 - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
FTC Engineering and Design Workshop - Worthington, Ohio	Develop a high retention of students from elementary school to high school robotics programs.	All feeder team students have the opportunity to connect to WorBots annually	15
Provided Published Resources - Vision Code	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	250
Worthington Market Day - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	1000

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Provided Published Resources - Programming	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	100
WKHS Introduction to Engineering and Design Presentation 1 (1st Period) - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
WKHS Introduction to Engineering and Design Presentation 2 (2nd Period) - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
WKHS Introduction to Engineering and Design Presentation 3 (7th Period) - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
WKHS Principles of Engineering Presentation 1 (3rd Period) - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
WKHS Principles of Engineering Presentation 3 (5th Period) - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
WKHS Principles of Engineering Presentation 2 (8th Period) - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	25
FIRST Tech Challenge Team 16284	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	15

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
FIRST LEGO League Team 61943	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	15
FIRST LEGO League Team 44451	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	15
FIRST LEGO League Team 44452	Develop a high retention of students from elementary school to high school robotics programs.	At least 80% of elementary school robotics program students join FRC teams.	15
FLL Workshop Tour - Worthington, Ohio	Develop a high retention of students from elementary school to high school robotics programs.	All feeder team students have the opportunity to connect to WorBots annually	45
Fairport FLL Qualifier - Fairport, New York	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	500
Lake Shore Cryotronics Workshop Tour - Worthington, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Retain machine shop and sponsor relationships	20
2022-2023 Business Plan - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Recruitment Information Sheet - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Sponsorship Information Sheet - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2024 Branding Standards - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Kylie Dean's List Essay - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Natalie Dean's List Essay - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Mr. Karns Woodie Flowers Essay - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Recruitment Information Sheet - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Sponsorship Information Sheet - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2024 Branding Standards - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Kylie Dean's List Essay - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Natalie Dean's List Essay - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Mr. Karns Woodie Flowers Essay - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Impact Award Binder - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
2023 Impact Award Submission - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Outreach Tracking Template - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Incident Report Form Template - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Pit Safety Rules Poster - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Power Tool Approval Template - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Shop Safety Procedures Template - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Safety Information Cards - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Safety Posters and Templates - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Safety Procedures - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Safety Shop Stock Template - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Welcome Poster (Shop Reminder) - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Charged Up Technical Binder - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Sponsor Levels Sheet - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
Feeder Team Information Sheet - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	50
AI Datasets - Website	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	300

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
Interactive Robotics Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	45
ScratchJr Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	10
TWHS Curriculum Night - Worthington, Ohio	Strengthen partnership at TWHS to retain members from both schools.	5 consecutive seasons of equal membership between schools.	400
Alum Creek Introduction to STEM and Trades Fair 4th Grade Session - Olentangy, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	125
Alum Creek Introduction to STEM and Trades Fair 5th Grade Session - Olentangy, Ohio	Mature partnerships with businesses, schools, and educational institutions.	Reach groups beyond our small community and maintain means of doing so.	125
ScratchJr Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	10
Girl Scouts Robotics Badge Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	25
WKHS Curriculum Night - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	400

Three-Year Outreach Event Breakdown

Activity	Long-Term Goal	Indicator Worked Toward	Reach
ScratchJr Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	10
Worthington Estates Elementary Science Fair - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in events at all schools — regardless of feeder team status.	250
Worthington Science Day - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	1000
ScratchJr Workshop - Worthington, Ohio	Expand the presence of *FIRST* within Worthington and Worthington Schools.	Run or participate in at least 3 whole-community events seasonally.	10

IMPACT AWARD
SUBMISSION

Executive Summaries

Describe the impact of the *FIRST* program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in *FIRST* programs as mentors/sponsors.
In the last three years, 100% of our alumni graduated from high school and went to college (compared to 92% and 83% of alumni district-wide respectively) and 92% pursued STEM degrees (compared to ~40% district-wide). 71% of alumni from the past 3 years remain involved in FIRST through event volunteering and *FIRST* mentorship. Our team members have a 3.9 unweighted/4.1 weighted GPA average (3.1 district unweighted average) with 75% of students taking PLTW courses in addition to team involvement.

Describe your community along with how your team addresses its unique opportunities and circumstances.
11 elementary, 5 middle, and 2 high schools make up Worthington City Schools. Before our team, PLTW courses were the sole access point for STEM. To increase access, we started 4 student-mentored *FIRST* teams we fund annually, promote STEM at 40+ events annually, partner with SWENext groups and PLTW classes, and advocate for STEM within our school district. Students on our team also work with engineers from our sponsors, providing real-world STEM exposure to Worthington students.

Describe the team's methods, with emphasis on the past 3 years, for spreading the *FIRST* message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?
We host the CORI Invitational for 30+ teams, which school officials and community members attend to see FIRST in action. We advocate for STEM spaces, funding, and events to our school board annually, all of which have been achieved. For youth, we started and sustained a FIRST pathway of 100 kids annually on 5 FIRST teams and run activities for all ages. Outreach and feeder teams excite youth about STEM; 37.5% of our members come from a feeder team and 87% attended outreach prior to joining.

Please provide specific examples of how your team members act as role models within the *FIRST* community with emphasis on the past 3 years.
We published 27 resources on our website covering all topics—reaching 200 teams. At the 2023 Greater Pittsburgh Regional, FRC 7570 from Poland and 8861 from Turkey didn't have many members of their team to cheer them on because of the far distance, so we made posters to support them each match—even when they were on the opposing alliance. We give safety kits to every team at every event and rookie goodie bags to new teams including treats and cards including lessons we've learned.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.
We started, funded, and mentor 3 FLL and 1 FTC team. We met with 7 schools and our Director of Primary Education to grow Worthington *FIRST*. We virtually assisted 3 teams from Brazil (7565, 7567, and 9487) with award submissions and operations in 2023. From 2022 to now, we have consistently worked with FRC 8856 (now 9545), helping them with everything from outreach to competition packing lists. We connected initiatives in Germany and India with resources for starting *FIRST* teams.

Executive Summaries

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?
We work with the 1-week Gateway to Technology Camp, guiding elementary students through interactive STEM activities. We have made STEM engaging and fun for all through 128 events in the past 3 years (59 this season) such as coding workshops, engineering design challenges, demonstrations, science days, and STEM fairs. These events connected 87% of our current students (75% in 2023) with our pathway, as we are dedicated to not just reaching students but connecting them with STEM long-term.

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years.
ATS Automation and Lake Shore Cryotronics provide us with sponsorship, internships, and engineering advice, allowing our students to extend their STEM knowledge beyond high school. PATH Robotics provided a tour of their robotic welding facilities and they now mentor our team. FC Bank provides us space at Worthington Market Day and Columbus Crew games, connecting us with over 20,000 people in 2023. PLTW and business teachers work with us to connect STEM and business-focused students with *FIRST*.

Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, *FIRST*, and your communities.
We permanently reduced fees by 60% in 2022 and waive them as needed to ensure they're not a barrier. We support travel to competitions and the Championship as needed when we qualify, increasing accessibility. We partner with SWENext at our schools to run women in engineering workshops. We have an all-girls drive team for our off-season robot annually. 75% of our student leadership and 50% of our membership (33% in 2021) is female. We run STEM and leadership workshops for elementary Girl Scouts.

Explain how you ensure your team and the initiatives you have created will continue to run effectively for the foreseeable future.
87% of our team members joined because of outreach and 38% were involved in FLL or FTC, so WorBots know the importance of outreach even before they do their first event. Through documentation of steps to establish and run each event activity, we ensure team members can sustain every initiative. Peer-to-peer new member training ensures every student joins the team prepared and confident. We also sustain a rainy day fund to ensure the team can continue to operate if funding were to change.

Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years.
Each summer, we go through industrial parks and note STEM companies. We then send letters, call, and present to companies interested in partnering with us. Sponsors are investing in more than a robot, they're investing in the future of STEM; 6 alumni from the past 3 seasons currently are interning or working with sponsors. Tours, email updates, and photos/videos engage sponsors throughout the season. We went from barely making it through each season to maintaining a rainy day fund in 3 years.

Executive Summaries

Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.
We are working to standardize our mentorship of *FIRST* teams. We created a guide to prepare team members to best help whenever asked, whether that's answering questions through social media or providing at-competition help. We are also working on a student mentorship training series in partnership with our FLL and FTC coaches, walking prospective student mentors through the basics of each program, how to best support FLL and FTC students, and how to guide students through the *FIRST* Core Values.

Describe your team's goals to fulfill the mission of *FIRST* and the progress you have made towards those goals.
Our goal is to cultivate a culture of STEM in Worthington, Ohio. We built a feeder pathway of 100 students. When we were founded, we had less than 20 students, and *FIRST* was only at the high school level. In 3 years, we have gone from 10 to 40+ annual community events, growing STEM opportunities locally and expanding our annual reach by ~20,000. Through local advocacy, we secured STEM education spaces as Worthington remodels, providing educational opportunities for years to come.

Briefly describe other matters of interest to the *FIRST* Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique or particularly noteworthy.
This season, our team is working to develop STEM opportunities for youth in the Ohio Juvenile Justice System. We have developed activities booklets that use resources available to them to learn more about STEM through activities and experience alongside former correctional officers and presented this project to administrators of the Ohio Juvenile Justice System. We are now working with teachers in the Ohio Juvenile Justice System to make final modifications and implement this project.

(OPTIONAL) Please use this space to ask 1 question to your *FIRST* Impact Award Judges which will be answered after each event with feedback from the judges (250 characters maximum). Note: Questions asking what is required to win the award will not be answered.
How can we better provide insight on events in our written submissions and presentation—more stories or statistics?

Essay

Founded in 2012, the WorBots are cultivating a culture of STEM in Worthington, Ohio, by engaging, inspiring, and impacting our community. We connect both high schools in the Worthington City School district, Worthington Kilbourne High School (WKHS) and Thomas Worthington High School (TWHS). Despite the rivalry of our schools in nearly everything else, we partner in STEM education and inspiration, creating an impact felt throughout Worthington. When we began, we were a team of less than 20 FRC students. Today, our program of FIRST students encompasses nearly 100 students K-12 across 5 teams.

WE ENGAGE
We participated in 59 outreach events this season and 128 outreach events in the past three, engaging 200,000+ people in 3 years and spreading STEM locally. We annually host 15 interactive workshops and tours, connecting anyone from elementary schoolers to engineers with STEM hands-on! From engineering and design workshops for youth to lessons on driving a robot, we excite our community about STEM. At 5 pre-K-5 Scratch Jr. workshops, coding challenge events for middle schoolers, and 3 interactive robotics workshops, we connected over 100 kids with engaging STEM activities at a local library. Within our schools, we appear everywhere from curriculum nights to pep rallies and football games, and we connect engineering-focused students with FIRST through PLTW presentations reaching 200+ students annually. Further, we are regulars on both schools' student news segments.

We engage people throughout Ohio. We were chosen of the 28 Ohio teams American Electric Power (AEP) supports to be featured in "AEP Helps Robotics Teams Rise"— an internal article highlighting the "hours of planning, testing, reviewing, retesting", us being "passionate about community outreach, offering demonstrations at elementary schools and local events and organizing charity drives", and the impact their funding and support has on teams like ours. We were incredibly honored to represent FIRST and AEP in this article. At the Buckeye Regional, an AEP employee and his son stopped by our pit after reading about us in the article, as they learned about FIRST through this and wanted to see it in action. We were also featured in a subsection of the Columbus Dispatch, discussing FIRST in Worthington and the impact it has on students.

We engage youth through community events. At the 2024 Alum Creek Elementary Introduction to STEM and Trades Fair, we drove a robot and talked about STEM careers! At the Evening Street Eagle Expert Extravaganza, we ran a workshop for elementary schoolers teaching the engineering and design process through a game challenge they created solutions for. At Worthington Science Day, we bring a robot and discuss STEM education K-12 with 1,000 community members annually. At Bluffsview Elementary Care After School, we ran an interactive demonstration for 30 students aged 5-10. At Wilson Hill Elementary, we started and ran a robotics club teaching students STEM basics, exciting students who later went on to join FLL 61943. Through these events, we are not just reaching kids once; we are giving them skills, knowledge, confidence, and future STEM opportunities that generate a lasting impact, as shown by 87% of our team members attending an outreach event prior to joining.

Essay

We engage the broader Worthington community. At Worthington Market Day, the largest single-day event in Worthington bringing together 100,000 people from across Ohio, we drive a robot, speak to community members about STEM, and run engaging activities for young kids—not just showing them STEM but including them in it. Through this event, we've gained a mentor and connected 8 students with the Worthington *FIRST* Pathway in two years, reaching community members who once didn't know about STEM opportunities locally. At a Columbus Crew Game in 2023, we had a booth on the plaza where we reached 20,000 people. Here, we talked to families from 7 Central Ohio districts about how to get involved with FIRST. We also spoke to Paul LaRue, President and Member-at-large of the Ohio State Board of Education, who spoke with us about the future of STEM education in Ohio and said that programs like ours were shining stars.

WE INSPIRE

We inspire youth within our community to get involved with *FIRST*. We are creating a cohesive pathway for STEM through starting, funding, and mentoring FLL 44451, FLL 44452, FLL 61943, and FTC 16284, impacting 100+ students. We hosted the first annual Worthington *FIRST* Banquet in 2023 where each team showcased their team and robot to one another, exciting kids at each level about opportunities ahead. We also recognized and awarded each pathway student. We annually host FLL students in our shop where they present their Innovation Projects and drive our robot, exciting them for future opportunities in *FIRST*. We facilitated a brainstorming session for our FTC students after their kickoff this year, helping them get their season started. Our consistent partnership resulted in 80% student retention in the Worthington *FIRST* Pathway with 38% of WorBots being from these teams despite the oldest feeder team starting in 2018. Beginning in 2022, ATS Automation and Lake Shore Cryotronics have offered internships to recent team graduates, providing real-world STEM involvement and expanding our vision of a K-12 pathway through college.

We inspire young kids to explore STEM. At the Olentangy Caverns Geology Camps, we demonstrated our robot to 68 students ages 6-11 and talked about how robotics is in many aspects of the world around us—including geology! We also volunteer throughout the week-long Worthington Gateway to Technology Camp annually, where we work with 20+ elementary school students and guide them through STEAM crafts and activities, LEGO design challenges, and CAD. One of the kids' favorites was active origami, where they added LED lights and small motors to paper penguins. These activities bridged the gap between fundamental STEM knowledge and arts and crafts that typically excite younger kids, making STEM enjoyable for all.

We inspire girls throughout our district to get involved with STEM. In 2023, we hosted a group of 30 3rd-grade Girl Scouts for a shop tour to drive robots, learn programming basics, and complete an engineering and design course. We helped 25 1st-grade Girl Scouts earn their robotics badges by teaching them how robots moved as they learned to drive a robot in 2024. They also learned how to design their very own robot, and worked together to complete innovation challenges. At the end, they got their own "robot driver's licenses." At the high school level, we regularly work with SWENext groups to connect engineering-focused women with STEM. In 3 seasons, we have gone from 33% to 50% female, including 75% of team leadership this season.

Essay

WE IMPACT

We impact the future of STEM education in Worthington. In 2021, we began our Worthington STEM Advocacy Project to gain support for STEM, as both of our high schools were being remodeled and we were at risk of losing STEM space. We invited the school district to our shop to present the impact of STEM on Worthington students and the community. We then spoke about STEM at a school board meeting and a community planning meeting. The district invited us to a meeting with the directors of primary and secondary education and principals for both high schools to discuss growing FLL/FTC, where we were able to gain stipends for Worthington *FIRST*. Our presentation to the district also developed into an annual event in which we now present the status of STEM in Worthington and then unveil our new robot for the season. STEM spaces are now expanding at both high schools—securing STEM education opportunities for generations to come.

We impact the global *FIRST* community. We worked with FRC 7565 and 7567 from Brazil throughout this season, helping them prepare their award submissions, and we assisted rookie team 9487 from Brazil with team operations—all through Zoom and email. In 2022/2023, we connected FRC 6916 with sponsors, assisted them as they developed their robot, and aided them throughout the Buckeye Regional; we're now helping them to compete in the 2025 season. We also helped design slides for the 2023 Fairport FLL Qualifier, and one of our team families volunteered to set up, tear down, and run the event with FRC 578 while traveling to New York.

We impact our community through annual giveback activities. We participate in Turn for Troops, where we turn pens and write letters for veterans going on Honor Flights. We run resource drives for the Worthington Resource Pantry. Annually, we run LEGO drives with our FLL teams for the Ronald McDonald House of Nationwide Children's Hospital to share fun STEM activities with siblings of kids in the hospital—collecting 30+ LEGO kits each year. In 2021, we worked with FRC teams in Central Ohio to 3D-print face shields for essential workers in Delaware County during the Covid-19 pandemic. We also 3D printed adapted toys for a pre-schooler with limited mobility, such as a ferris wheel that produced bubbles when he pushed on a lever.

WE ARE THE WORBOTS

In the past 3 years, we've expanded STEM opportunities through a cohesive pathway of over 100, inspiring youth to get involved in STEM regardless of their background. We've impacted over 200,000 people through 128 events. Our vision for a K-12 pathway has paved the way for lifelong opportunities starting in kindergarten and extending to careers in engineering. Our work has not just built learning opportunities; it has made a concrete impact through expanded STEM spaces in our district, connections with local leaders allowing us to further build STEM education in Worthington and beyond, and projects expanding STEM where it once was not. As WorBots, we have joined two "rivaling" schools to create an impact felt by thousands—not only cultivating a culture of STEM in Worthington, Ohio but reaching far beyond.

Team Name: WorBots

Team Number: 4145

Impact Award Documentation Form

How to use this form

- In the chart, list all teams/events/items that you have documentation for. Please refer to the Official Impact Award Definitions for more information on the required/recommended documentation types.
- Label each piece of documentation with a "documentation ID". Attach the pieces of documentation to this form, in order of Documentation ID, and be sure to label each with its document id.
- **Please only turn in documentation for activities within the past 3-5 years.**

Team Number or Type of Activity & Location (i.e. *FIRST* LEGO League Team 9999 or 2019 District Event - Salem, MA)	**Date of Activity** (i.e. Fall 2019)	**Choose one of the Official Impact Definitions:**	**Type of Documentation** (letter, screenshot, photo, thank you card, etc)	**Documentation ID** (use numerical numbers i.e. ID-001)
STEM Fair - Worthington, Ohio	February 4, 2019	Reached	Photo	ID-001
Worthingway Middle School STEM Night - Worthington, Ohio	February 20, 2019	Reached	Photo	ID-002
Kilbourne Shop Tour - Worthington, Ohio	March 1, 2019	Reached	Photo	ID-003
Middle School Robotics Competition - Worthington, Ohio	April 15, 2019	Reached	Photo	ID-004
McCord Shop Tour - Worthington, Ohio	April 18, 2019	Reached	Photo	ID-005
Bluffsview Elementary Science Night - Worthington, Ohio	June 17, 2019	Reached	Photo	ID-006
Worthington School Board Meeting - Worthington, Ohio	September 23, 2019	Advocated	Photo	ID-007
Provided Published Resources - Robot Code	October 5, 2019	Provided Published Resources	Screenshot	ID-008
Provided Published Resources - Vision Code	October 5, 2019	Provided Published Resources	Screenshot	ID-009
FIRST LEGO League Team 44451	October 2019	Started	Screenshot	ID-010
FIRST LEGO League Team 44452	October 2019	Started	Screenshot	ID-011
FIRST Tech Challenge Team 16284	October 2019	Started	Screenshot	ID-012
FIRST LEGO League Team 44451	October 2019	Mentored	Photo	ID-013
FIRST LEGO League Team 44452	October 2019	Mentored	Screenshot	ID-014

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FIRST Tech Challenge Team 16284	October 2019	Mentored	Photo	ID-015
WKHS Football Game - Worthington, Ohio	October 4, 2019	Reached	Photo	ID-016
CORI Invitational - Worthington, Ohio	October 13, 2019	Hosted, Support	Photo	ID-017
FIRST LEGO League Team 44451	January 2020	Mentored	Photo	ID-018
FIRST LEGO League Team 44452	January 2020	Mentored	Photo	ID-019
FIRST Tech Challenge Team 16284	January 2020	Mentored	Photo	ID-020
Science Day - Worthington, Ohio	March 8, 2020	Reached	Photo	ID-021
Provided Published Resources - Robot Code	October 7, 2020	Provided Published Resources	Screenshot	ID-022
FIRST LEGO League Team 44451	January 2021	Mentored	Photo	ID-023
FIRST LEGO League Team 44452	January 2021	Mentored	Photo	ID-024
FIRST Tech Challenge Team 16284	January 2021	Mentored	Photo	ID-025
WKHS Freshman Orientation Robot Demonstration - Worthington, Ohio	August 1, 2021	Reached	Photo	ID-026
Provided Published Resources - AI Vision	October 5, 2021	Provided Published Resources	Screenshot	ID-027
Provided Published Resources - Robot Code	October 5, 2021	Provided Published Resources	Screenshot	ID-028
FLL Robot Demonstration - Worthington, Ohio	December 18, 2021	Reached	Photo	ID-029
Columbus Dispatch Article - Worthington, Ohio	January 27, 2022	Reached	Photo	ID-030
Wilson Hill LEGO Robotics Club - Worthington, Ohio	March 2022	Started	Photo	ID-031
Published Business Resources	March 1, 2022	Provided Published Resources	Photo of Resource	ID-032
Published Recruiting Resources	March 1, 2022	Provided Published Resources	Photo of Resource	ID-033
Meeting with School District Officials for *FIRST* Support - Worthington, Ohio	March 2, 2022	Advocated	Photo	ID-034
Meeting with Principals and the Directors of Primary and	March 14, 2022	Advocated	Screenshot	ID-035

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Secondary Education for Worthington *FIRST* Support - Worthington, Ohio				
Worthington Kilbourne Student News Segment - Worthington, Ohio	March 25, 2022	Reached	Screenshot	ID-036
Thomas Worthington Student News Segment - Worthington, Ohio	March 25, 2022	Reached	Screenshot	ID-037
Wilson Hill LEGO Robotics Club - Worthington, Ohio	March 30, 2022	Mentored	Photo	ID-038
Worthington Kilbourne Activities Fair - Worthington, Ohio	April 25, 2022	Reached	Photo	ID-039
Bluffsview CAS Robot Demonstration - Worthington, Ohio	April 26, 2022	Reached	Photo	ID-040
May 5th, 2022 Elementary School Shop Tour - Worthington Ohio	April 27, 2022	Reached	Photo	ID-041
May 10th, 2022 Elementary School Shop Tour - Worthington Ohio	April 28, 2022	Reached	Photo	ID-042
May 12th, 2022 Elementary School Shop Tour - Worthington Ohio	April 29, 2022	Reached	Photo	ID-043
Olentangy Caverns Robot Demonstration Week 1 - Olentangy, Ohio	April 30, 2022	Reached	Photo	ID-044
Worthington Libraries LEGO Battle Bots - Worthington, Ohio	May 1, 2022	Reached	Photo	ID-045
Olentangy Caverns Robot Demonstration Week 2 - Olentangy, Ohio	May 2, 2022	Reached	Photo	ID-046
School Board Meeting STEM Advocacy - Worthington, Ohio	May 3, 2022	Advocated	Photo	ID-047
Germany *FIRST* Support	May 4, 2022	Reached	Photo	ID-048
Thomas Worthington Freshman Activities Fair - Worthington, Ohio	May 5, 2022	Reached	Photo	ID-049
Worthington Kilbourne Freshman First Day - Worthington, Ohio	May 6, 2022	Reached	Photo	ID-050
Demonstration for Freshmen PLTW Class 1 - Worthington, Ohio	May 7, 2022	Reached	Photo	ID-051
Demonstration for Freshmen PLTW Class 2 - Worthington, Ohio	May 8, 2022	Reached	Photo	ID-052
Thomas Worthington High School Newsletter	May 9, 2022	Reached	Screenshot	ID-053

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Thomas Worthington Student News Interview	May 10, 2022	Reached	Photo	ID-054
Thomas Worthington Involvement Fair - Worthington, Ohio	May 11, 2022	Reached	Photo	ID-055
POE Presentation 1 - Worthington, Ohio	May 12, 2022	Reached	Photo	ID-056
POE Presentation 2 - Worthington, Ohio	May 13, 2022	Reached	Photo	ID-057
POE Presentation 3 - Worthington, Ohio	May 14, 2022	Reached	Photo	ID-058
CAD Presentation - Worthington, Ohio	May 15, 2022	Reached	Photo	ID-059
FIRST LEGO League Team 57154	October 2022	Started	Screenshot	ID-060
FIRST Tech Challenge Team 16284	October 2022	Mentored	Photo	ID-061
FIRST LEGO League Team 57154	October 2022	Mentored	Photo	ID-062
FIRST LEGO League Team 44451	October 2022	Mentored	Photo	ID-063
FIRST LEGO League Team 44452	October 2022	Mentored	Photo	ID-064
FIRST Robotics Competition Team 6916	October 2022	Mentored	Photo	ID-065
FIRST Robotics Competition Team 8856	October 2022	Assisted, Provided Published Resources	Screenshot	ID-066
Provided Published Resources - Robot Code	October 1, 2022	Provided Published Resources	Screenshot	ID-067
Provided Published Resources - ROS Path Generator	October 1, 2022	Provided Published Resources	Screenshot	ID-068
Worthington Market Day - Worthington, Ohio	October 8, 2022	Reached	Photo	ID-069
Worthington Middle School Shop Tour - Worthington, Ohio	October 16, 2022	Reached	Photo	ID-070
CORI Invitational - Worthington, Ohio	October 23, 2022	Hosted, Support	Photo	ID-071
Lake Shore Shop Tour - Worthington, Ohio	November 10, 2022	Reached	Photo	ID-072
ATS Shop Tour - Worthington, Ohio	November 16, 2022	Reached	Photo	ID-073
FLL Shop Tour - Worthington, Ohio	December 7, 2022	Reached	Photo	ID-074
Curriculum Night Presentation - Worthington, Ohio	January 25, 2023	Reached	Photo	ID-075
Impower.ai Presentation - Worthington, Ohio	February 4, 2023	Reached	Photo	ID-076
Chipotle Presentation - Worthington, Ohio	February 11, 2023	Reached	Photo	ID-077

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Merrill Lynch Presentation - Worthington, Ohio	February 25, 2023	Reached	Photo	ID-078
Safety Kits - Worthington, Ohio	March 2023	Provided Published Resources	Photo	ID-079
Community Robot Reveal - Worthington, Ohio	March 6, 2023	Reached	Photo	ID-080
Worthington School Board Presentation / Robot Reveal - Worthington, Ohio	March 8, 2023	Advocated	Photo	ID-081
Girl Scouts Event - Worthington, Ohio	March 9, 2023	Reached	Photo	ID-082
AEP Article	March 10, 2023	Reached	Photo	ID-083
Eagle Extravaganza Workshop - Worthington, Ohio	March 22, 2023	Reached	Photo	ID-084
FIRST Robotics Competition Team 8091	March 24, 2023	Provided Published Resources	Photo	ID-085
Worthington Kilbourne Pep Rally - Worthington, Ohio	May 5, 2023	Reached	Photo	ID-086
Elementary School Shop Tour 1 - Worthington, Ohio	May 9, 2023	Reached	Photo	ID-087
Elementary School Shop Tour 2 - Worthington, Ohio	May 10, 2023	Reached	Photo	ID-088
Elementary School Shop Tour 3 - Worthington, Ohio	May 11, 2023	Reached	Photo	ID-089
Middle School Shop Tour - Worthington, Ohio	May 17, 2023	Reached	Photo	ID-090
Worthington *FIRST* Banquet - Worthington, Ohio	May 20, 2023	Reached	Photo	ID-091
FTC Workshop Tour - Worthington, Ohio	May 20, 2023	Reached	Photo	ID-092
Worthington School Board Meeting - Worthington, Ohio	May 22, 2023	Advocated	Photo	ID-093
Middle School STEM Camp 1 - Worthington, Ohio	June 10, 2023	Reached	Photo	ID-094
FIRST Robotics Competition Team 7565	June 16, 2023	Assisted, Provided Published Resources	Photo	ID-095
Worthington Park Break Out the Alien Code Middle School Coding Workshop - Worthington, Ohio	June 23, 2023	Reached	Photo	ID-096
FIRST Robotics Competition Team Krypton	June 27, 2023	Assisted, Provided Published Resources	Photo	ID-097
FIRST Robotics Competition Team 7567	June 28, 2023	Assisted, Provided Published Resources	Photo	ID-098

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Worthington Park Family Fun Night Robots and Gadgets - Worthington, Ohio	July 10, 2023	Reached	Photo	ID-099
Columbus Crew Game - Columbus, Ohio	August 26, 2023	Reached	Photo	ID-100
Thomas Worthington High School Involvement Fair - Worthington, Ohio	September 1, 2023	Reached	Photo	ID-101
TWHS Introduction to Engineering and Design Presentation 1(8th Period) - Worthington, Ohio	September 1, 2023	Reached	Photo	ID-102
TWHS Principles of Engineering Presentation 1 (3rd Period) - Worthington, Ohio	September 6, 2023	Reached	Photo	ID-103
TWHS Principles of Engineering Presentation 2 (4th Period) - Worthington, Ohio	September 6, 2023	Reached	Photo	ID-104
TWHS Principles of Engineering Presentation 3 (5th Period) - Worthington, Ohio	September 6, 2023	Reached	Photo	ID-105
TWHS AP Computer Science A Presentation (1st Period) - Worthington, Ohio	September 6, 2023	Reached	Photo	ID-106
TWHS Introduction to Programming Logic Presentation (2nd Period) - Worthington, Ohio	September 6, 2023	Reached	Photo	ID-107
TWHS Introduction to Engineering and Design Presentation 2 (1st Period) - Worthington, Ohio	September 7, 2023	Reached	Photo	ID-108
TWHS Introduction to Engineering and Design Presentation 3 (2nd Period) - Worthington, Ohio	September 7, 2023	Reached	Photo	ID-109
TWHS Introduction to Engineering and Design Presentation 4 (7th Period) - Worthington, Ohio	September 7, 2023	Reached	Photo	ID-110
FTC Engineering and Design Workshop - Worthington, Ohio	September 19, 2023	Reached	Photo	ID-111
Provided Published Resources - Robot Code	September 27, 2023	Reached	Photo	ID-112
Worthington Market Day - Worthington, Ohio	September 30, 2023	Reached	Photo	ID-113
Provided Published Resources - Vision Code	September 31, 2023	Reached	Photo	ID-114

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WKHS Introduction to Engineering and Design Presentation 1 (1st Period) - Worthington, Ohio	October 5, 2023	Reached	Photo	ID-115
WKHS Introduction to Engineering and Design Presentation 2 (2nd Period) - Worthington, Ohio	October 5, 2023	Reached	Photo	ID-116
WKHS Introduction to Engineering and Design Presentation 3 (7th Period) - Worthington, Ohio	October 5, 2023	Reached	Photo	ID-117
WKHS Principles of Engineering Presentation 1 (3rd Period) - Worthington, Ohio	October 6, 2023	Reached	Photo	ID-118
WKHS Principles of Engineering Presentation 3 (5th Period) - Worthington, Ohio	October 6, 2023	Reached	Photo	ID-119
WKHS Principles of Engineering Presentation 2 (8th Period) - Worthington, Ohio	October 6, 2023	Reached	Photo	ID-120
FIRST Tech Challenge Team 16284	Fall 2023	Mentored	Photo	ID-121
FIRST LEGO League Team 61943	Fall 2023	Mentored	Photo	ID-122
FIRST LEGO League Team 44451	Fall 2023	Mentored	Photo	ID-123
FIRST LEGO League Team 44452	Fall 2023	Mentored	Screenshot	ID-124
FLL Workshop Tour - Worthington, Ohio	December 4, 2023	Reached	Screenshot	ID-125
Fairport FLL Qualifier - Fairport, New York	December 10, 2023	Support	Photo	ID-126
Lake Shore Crytotronics Workshop Tour - Worthington, Ohio	December 14, 2023	Reached	Photo	ID-127
2022-2023 Business Plan - Website	January 1st, 2024	Provided Published Resources	Photo	ID-128
Recruitment Information Sheet - Website	January 1st, 2024	Provided Published Resources	Photo	ID-129
Sponsorship Information Sheet - Website	January 1st, 2024	Provided Published Resources	Photo	ID-130
2024 Branding Standards - Website	January 1st, 2024	Provided Published Resources	Photo	ID-131
2023 Kylie Dean's List Essay - Website	January 1st, 2024	Provided Published Resources	Photo	ID-132

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2023 Natalie Dean's List Essay - Website	January 1st, 2024	Provided Published Resources	Photo	ID-133
2023 Mr. Karns Woodie Flowers Essay - Website	January 1st, 2024	Provided Published Resources	Photo	ID-134
2023 Impact Award Binder - Website	January 1st, 2024	Provided Published Resources	Photo	ID-135
2023 Impact Award Submission - Website	January 1st, 2024	Provided Published Resources	Photo	ID-136
Outreach Tracking Template - Website	January 1st, 2024	Provided Published Resources	Photo	ID-137
Incident Report Form Template - Website	January 1st, 2024	Provided Published Resources	Photo	ID-138
Pit Safety Rules Poster - Website	January 1st, 2024	Provided Published Resources	Photo	ID-139
Power Tool Approval Template - Website	January 1st, 2024	Provided Published Resources	Photo	ID-140
Shop Safety Procedures Template - Website	January 1st, 2024	Provided Published Resources	Photo	ID-141
Safety Information Cards - Website	January 1st, 2024	Provided Published Resources	Photo	ID-142
Safety Posters and Templates - Website	January 1st, 2024	Provided Published Resources	Photo	ID-143
Safety Procedures - Website	January 1st, 2024	Provided Published Resources	Photo	ID-144
Safety Shop Stock Template - Website	January 1st, 2024	Provided Published Resources	Photo	ID-145
Welcome Poster (Shop Reminder) - Website	January 1st, 2024	Provided Published Resources	Photo	ID-146
Charged Up Technical Binder - Website	January 1st, 2024	Provided Published Resources	Photo	ID-147
Sponsor Levels Sheet - Website	January 1st, 2024	Provided Published Resources	Photo	ID-148

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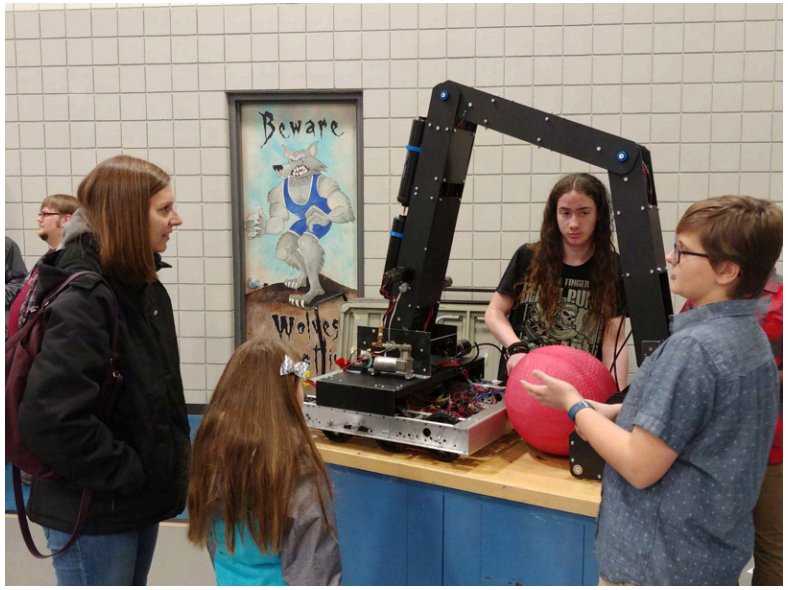
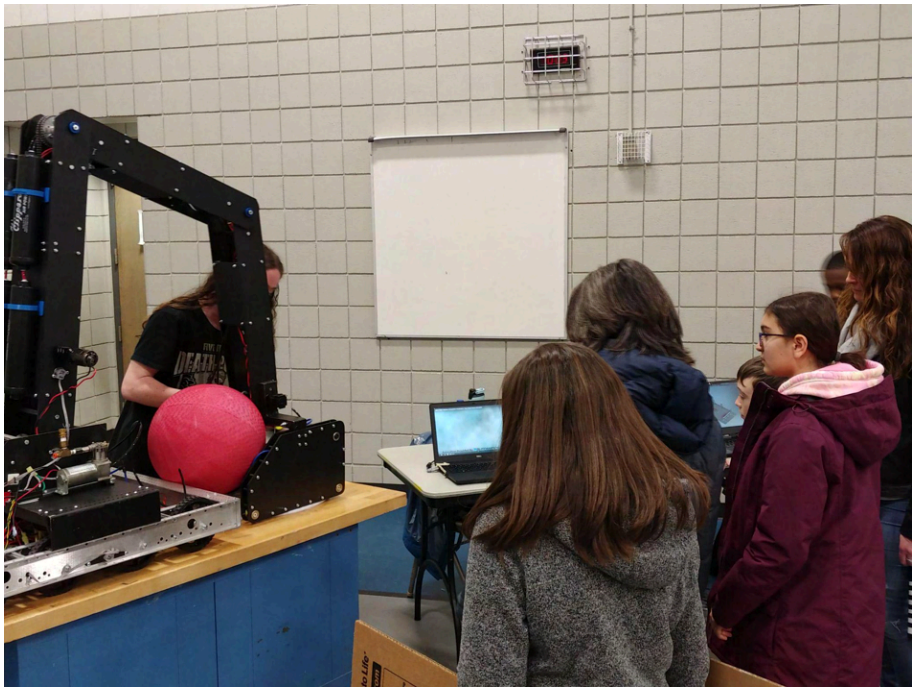
Feeder Team Information Sheet - Website	January 1st, 2024	Provided Published Resources	Photo	ID-149
AI Datasets - Website	January 1st, 2024	Provided Published Resources	Photo	ID-150
Interactive Robotics Workshop - Worthington, Ohio	January 15th, 2024	Reached	Photo	ID-151
ScratchJr Workshop - Worthington, Ohio	January 16th, 2024	Reached	Photo	ID-152
TWHS Curriculum Night - Worthington, Ohio	January 17th, 2024	Reached	Photo	ID-153
Alum Creek Introduction to STEM and Trades Fair 4th Grade Session - Olentangy, Ohio	January 18th, 2024	Reached	Photo	ID-154
Alum Creek Introduction to STEM and Trades Fair 5th Grade Session - Olentangy, Ohio	January 18th, 2024	Reached	Photo	ID-155
ScratchJr Workshop - Worthington, Ohio	January 23rd, 2024	Reached	Photo	ID-156
Girl Scouts Robotics Badge Workshop - Worthington, Ohio	January 23rd, 2024	Reached	Photo	ID-157
WKHS Curriculum Night - Worthington, Ohio	January 24th, 2024	Reached	Photo	ID-158
ScratchJr Workshop - Worthington, Ohio	January 30th, 2024	Reached	Photo	ID-159
Worthington Estates Elementary Science Fair - Worthington, Ohio	January 31st, 2024	Reached	Photo	ID-160
Worthington Science Day - Worthington, Ohio	February 3rd, 2024	Reached	Photo	ID-161
ScratchJr Workshop - Worthington, Ohio	February 6th, 2024	Reached	Photo	ID-162
ScratchJr Workshop - Worthington, Ohio	February 13th, 2024	Reached	Photo	ID-163
Columbus Council on World Affairs Presentation - Columbus, Ohio	February 15th, 2024	Reached	Photo	ID-164
Robot Round-Up Worthington Libraries Workshop - Worthington, Ohio	March 5th, 2024	Reached	Photo	ID-165

Team Name: WorBots

Team Number: 4145

ID-001





Team Name: WorBots

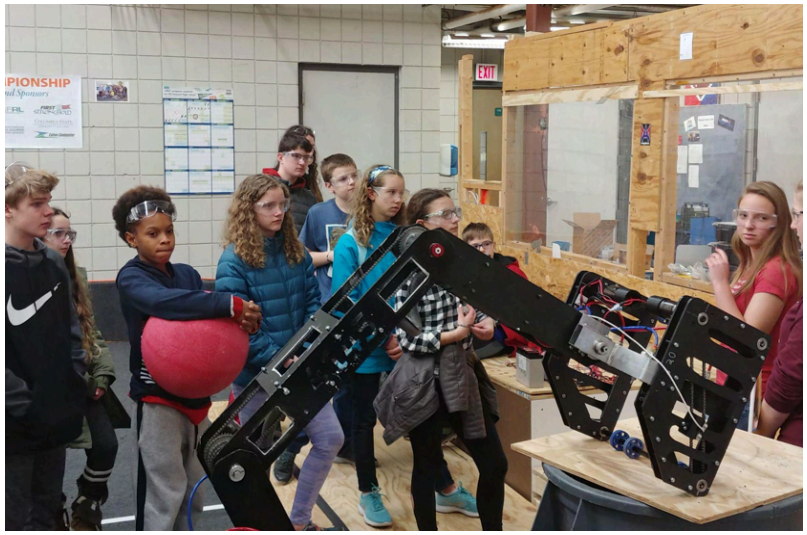
Team Number: 4145

ID-002

Team Name: WorBots

Team Number: 4145

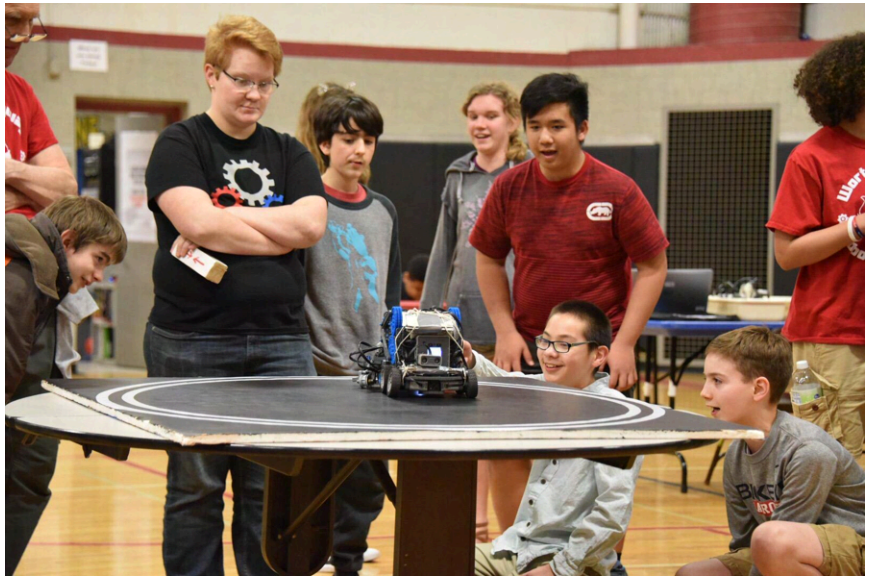
ID-003

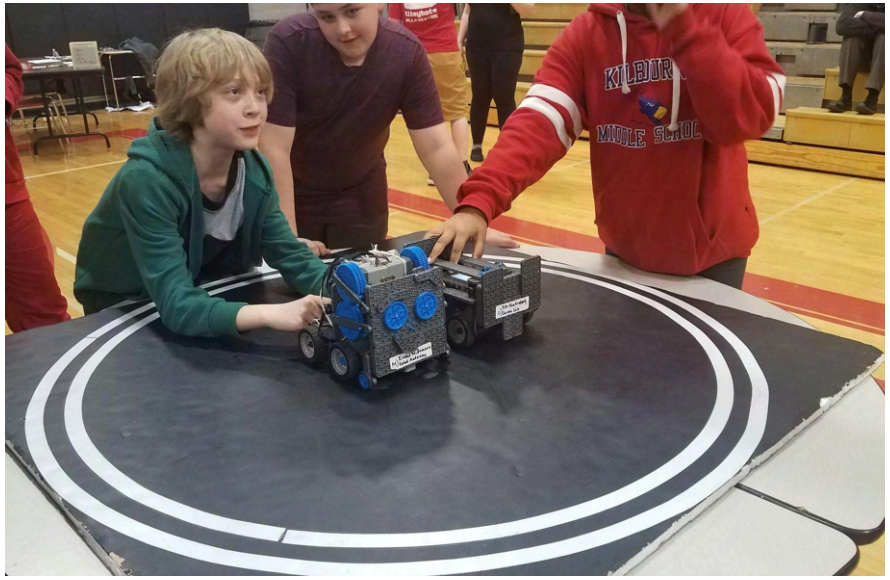


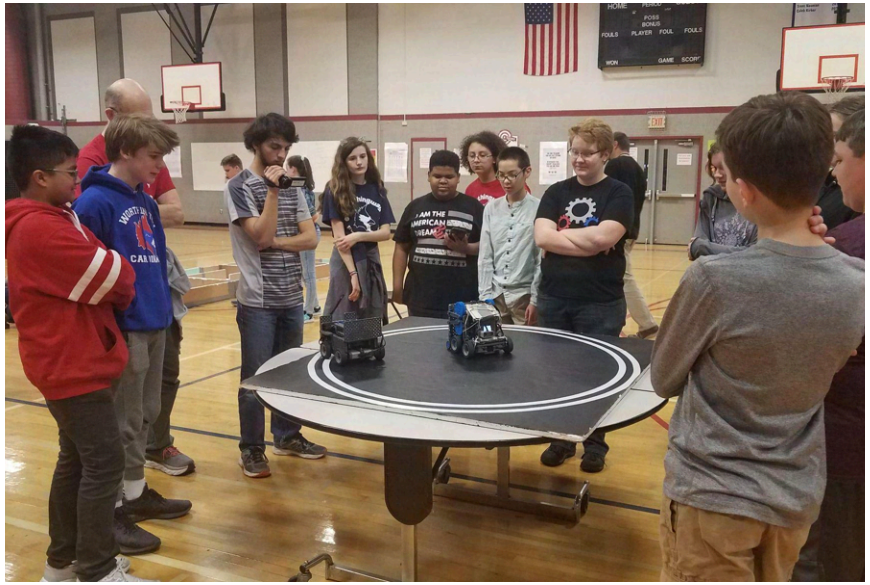
Team Name: WorBots

Team Number: 4145

ID-004



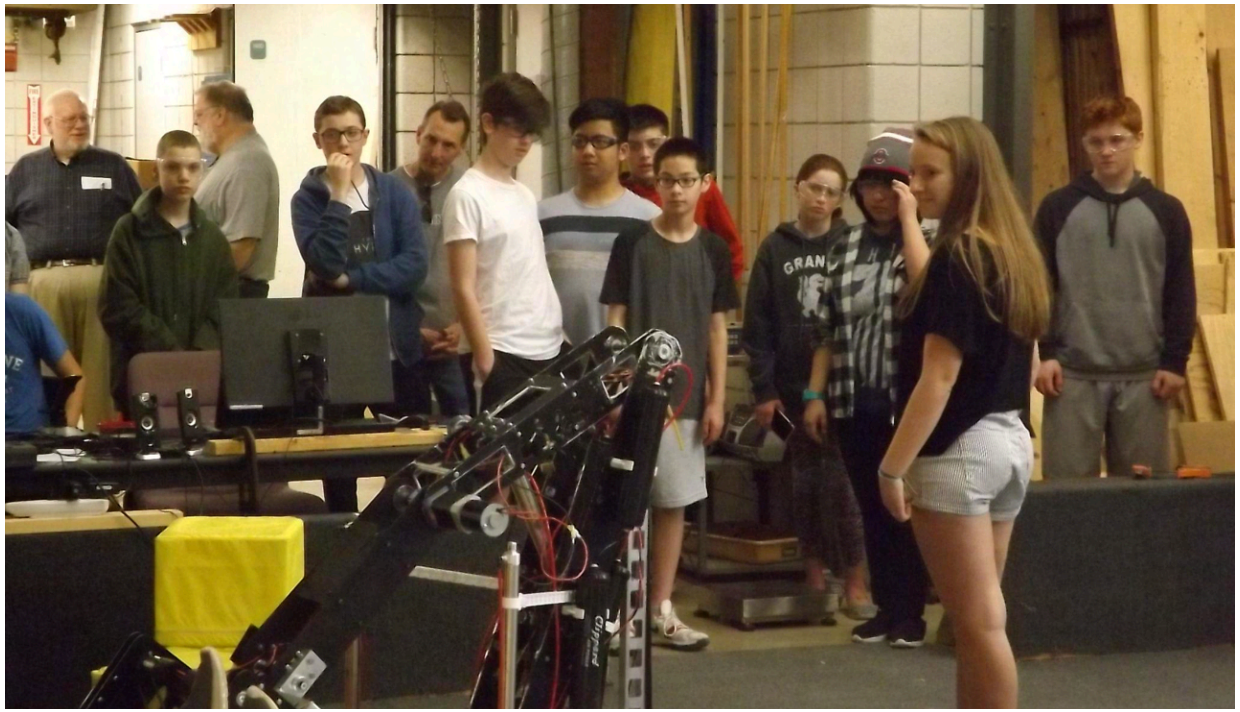


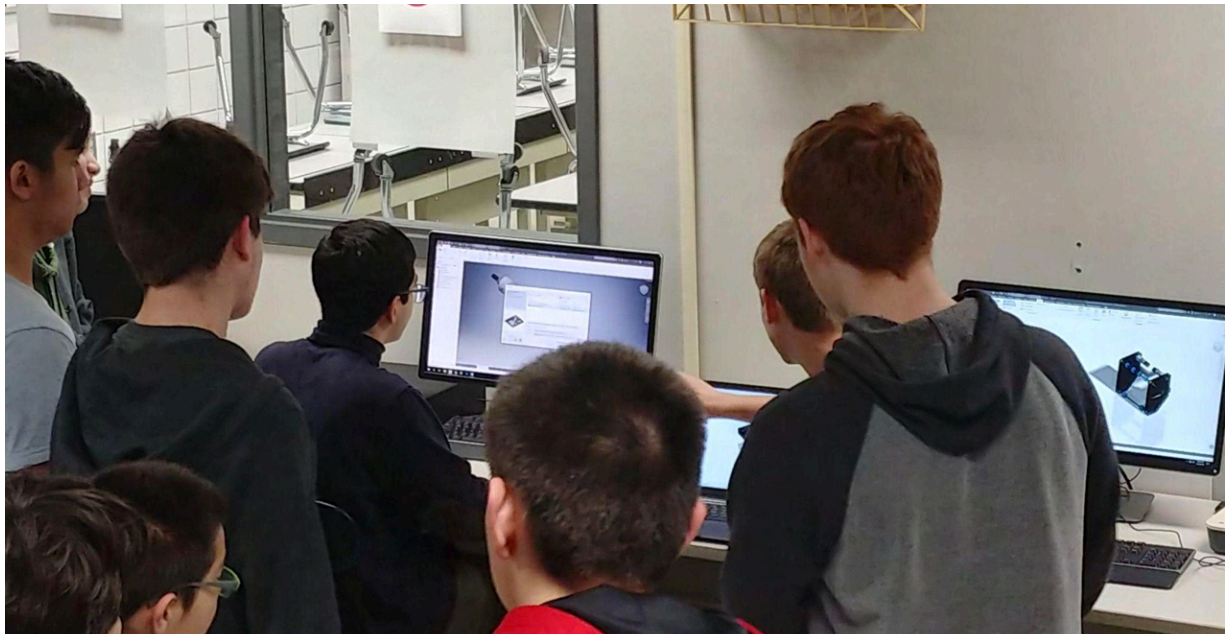


Team Name: WorBots

Team Number: 4145

ID-005





Team Name: WorBots

Team Number: 4145

ID-006

Team Name: WorBots

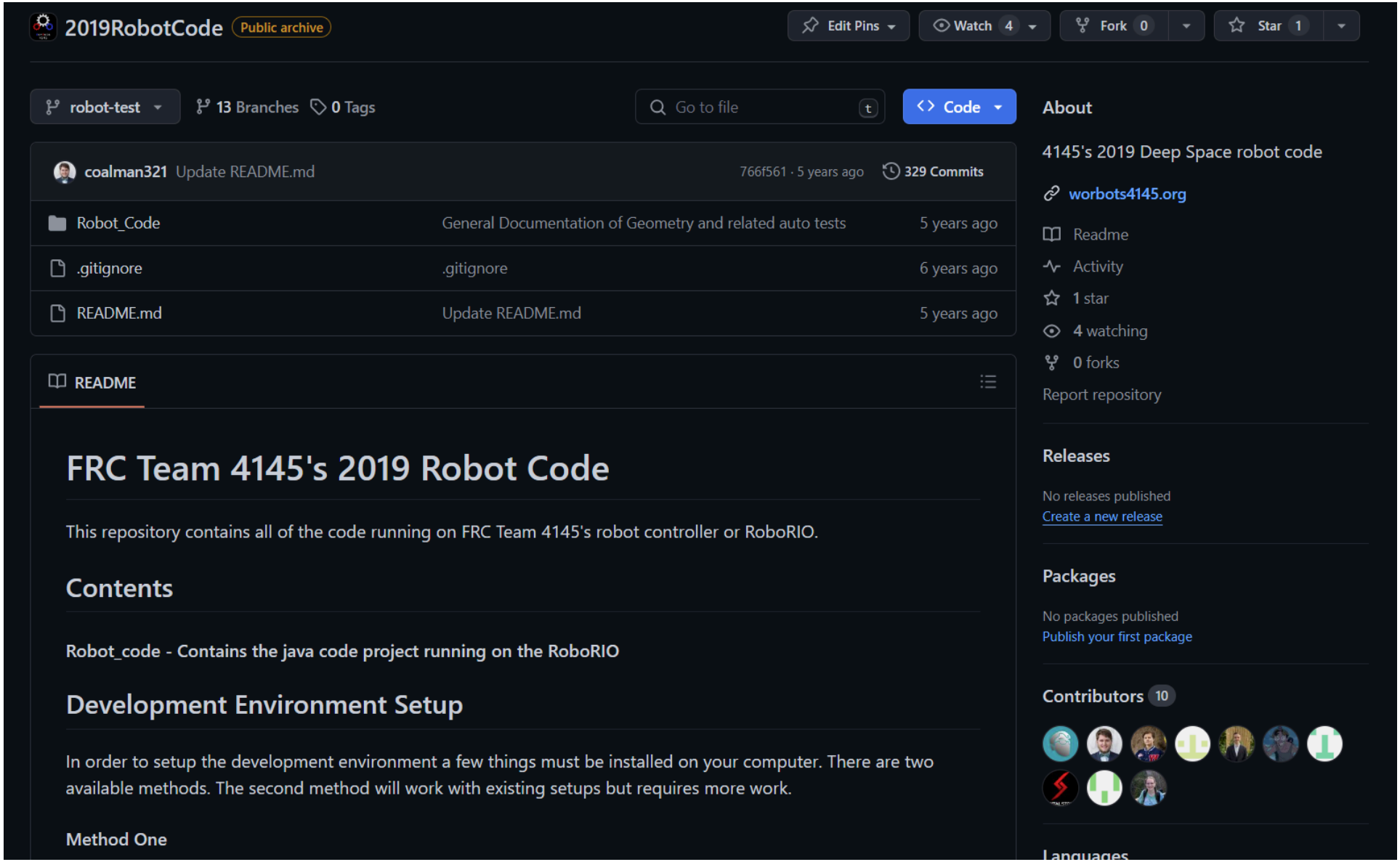
Team Number: 4145

ID-007

Team Name: WorBots

Team Number: 4145

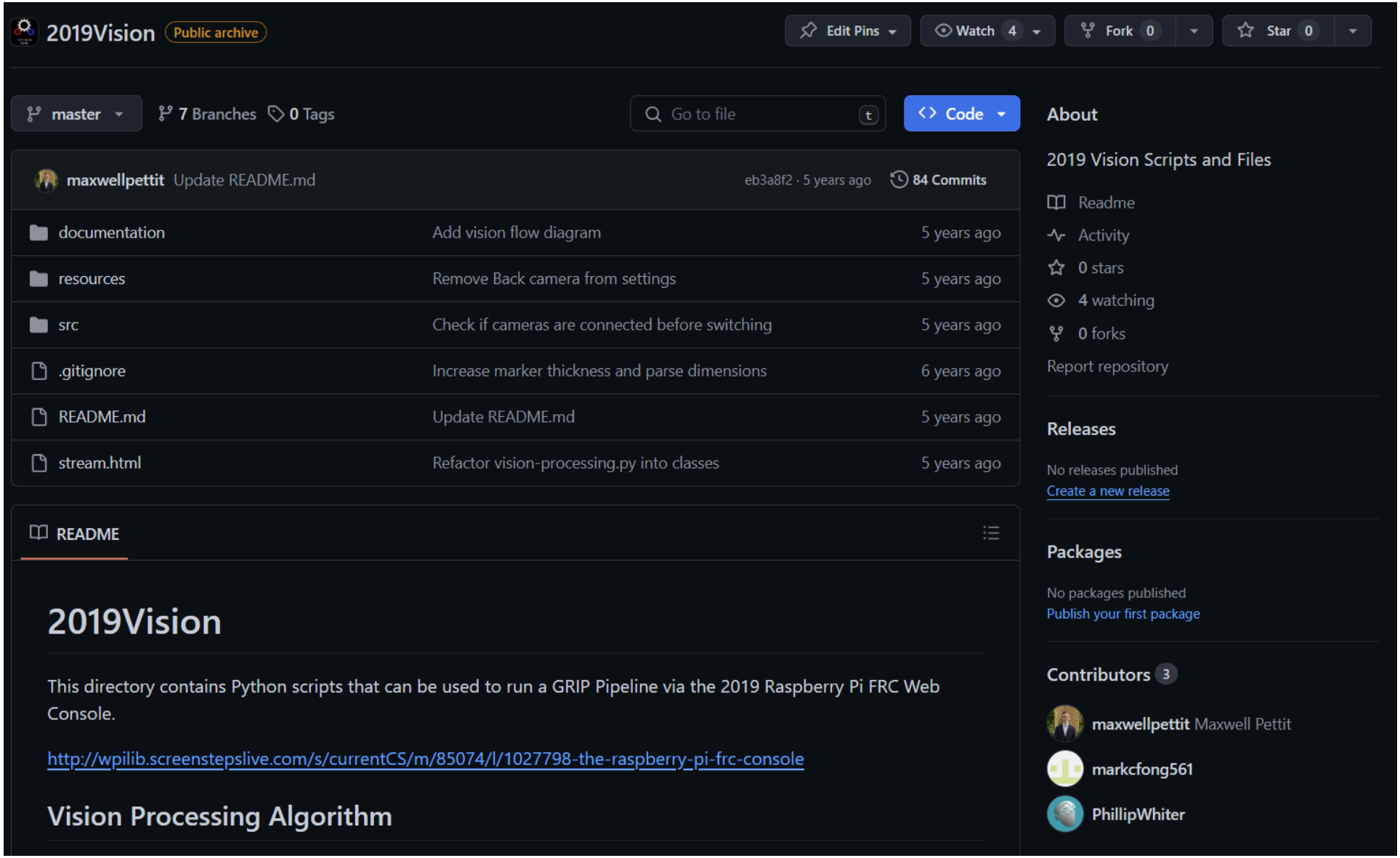
ID-008



Team Name: WorBots

Team Number: 4145

ID-009



Team Name: WorBots

Team Number: 4145

ID-010

to bmorgan, estack

Hello,

My name is Katherine and I'm a senior at Worthington Kilbourne High School. I'm also President and Captain of the WorBots, which is Worthington's combined high school robotics team. We were created in 2012 as part of the FIRST Robotics Competition, and each year we design and construct a robot to compete at competitions. We have recognized a need to establish a cohesive K-12 robotics pathway, and would therefore like to establish FIRST Lego League teams for Worthington elementary schools. Rather than run the teams, we would like to guide interested adults and students in creating them and provide support.

To do this, it is necessary to establish a link between our team and your school. If you do not believe you are the right person for me to communicate with, and would instead like to refer me to another science or math teacher, that is fine. I will need a liaison to aid in spreading this information and informing me of any interest expressed.

Here is an excerpt from the FLL website on how the organization works:

> Every year, *FIRST* LEGO League releases a Challenge, which is based on a real-world scientific topic.
>
> Each Challenge has three parts: the **Robot Game**, the **Project**, and the **Core Values**. Teams of up to ten children, with at least two adult coaches, participate in the Challenge by programming an autonomous robot to score points on a themed playing field (Robot Game), developing a solution to a problem they have identified (Project), all guided by the *FIRST* LEGO League Core Values. Teams may then attend an official tournament, hosted by our *FIRST* LEGO League Partners.

Visit http://www.firstlegoleague.org/ and https://www.firstinspires.org/ for more information.

Thank you,

Katherine Poe

Student President

Team Name: WorBots

Team Number: 4145

ID-011

to bmorgan, estack

Hello,

My name is Katherine and I'm a senior at Worthington Kilbourne High School. I'm also President and Captain of the WorBots, which is Worthington's combined high school robotics team. We were created in 2012 as part of the FIRST Robotics Competition, and each year we design and construct a robot to compete at competitions. We have recognized a need to establish a cohesive K-12 robotics pathway, and would therefore like to establish FIRST Lego League teams for Worthington elementary schools. Rather than run the teams, we would like to guide interested adults and students in creating them and provide support.

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>
> Each Challenge has three parts: the **Robot Game**, the **Project**, and the **Core Values**. Teams of up to ten children, with at least two adult coaches, participate in the Challenge by programming an autonomous robot to score points on a themed playing field (Robot Game), developing a solution to a problem they have identified (Project), all guided by the *FIRST* LEGO League Core Values. Teams may then attend an official tournament, hosted by our *FIRST* LEGO League Partners.

Visit http://www.firstlegoleague.org/ and https://www.firstinspires.org/ for more information.

Thank you,

Katherine Poe

Student President

Team Name: WorBots

Team Number: 4145

ID-012

to kcermak, mgordon

Hello,

My name is Katherine and I'm a senior at Worthington Kilbourne High School. I'm also President and Captain of the WorBots, which is Worthington's combined high school robotics team. We were created in 2012 as part of the FIRST Robotics Competition, and each year we design and construct a robot to compete at competitions. We have recognized a need to establish a cohesive K-12 robotics pathway, and would therefore like to establish FIRST Tech Challenge teams for Worthington middle schools. Rather than run the teams, we would like to guide interested adults and students in creating them and provide support.

To do this, it is necessary to establish a link between our team and your school. If you do not believe you are the right person for me to communicate with, and would instead like to refer me to another science or math teacher, that is fine. I will need a liaison to aid in spreading this information and informing me of any interest expressed.

Here is an excerpt from the FTC website on how the organization works:

> **It's way more than building robots.** *FIRST* Tech Challenge teams (10+ members, grades 7-12) are challenged to design, build, program, and operate robots to compete in a head-to-head challenge in an alliance format. Participants call it "the hardest fun you'll ever have!"
>
> Guided by adult Coaches and Mentors, students develop STEM skills and practice engineering principles (like keeping an engineering notebook), while realizing the value of hard work, innovation, and sharing ideas. The robot kit is reusable from year-to-year and can be programmed using a variety of languages, including Java. Teams also must raise funds, design and market their team brand, and do community outreach for which they can win awards. Participants have access to tens of millions of dollars in college scholarships. Each season concludes with Super-Regional Championships and an exciting *FIRST* Championship.

Visit https://www.firstinspires.org/robotics/ftc for more information.

Thank you,

Katherine Poe

Team Name: WorBots

Team Number: 4145

ID-013

Team Name: WorBots

Team Number: 4145

ID-014

Team Name: WorBots

Team Number: 4145

ID-015

Team Name: WorBots

Team Number: 4145

ID-016

Team Name: WorBots

Team Number: 4145

ID-017

Team Name: WorBots

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ID-018

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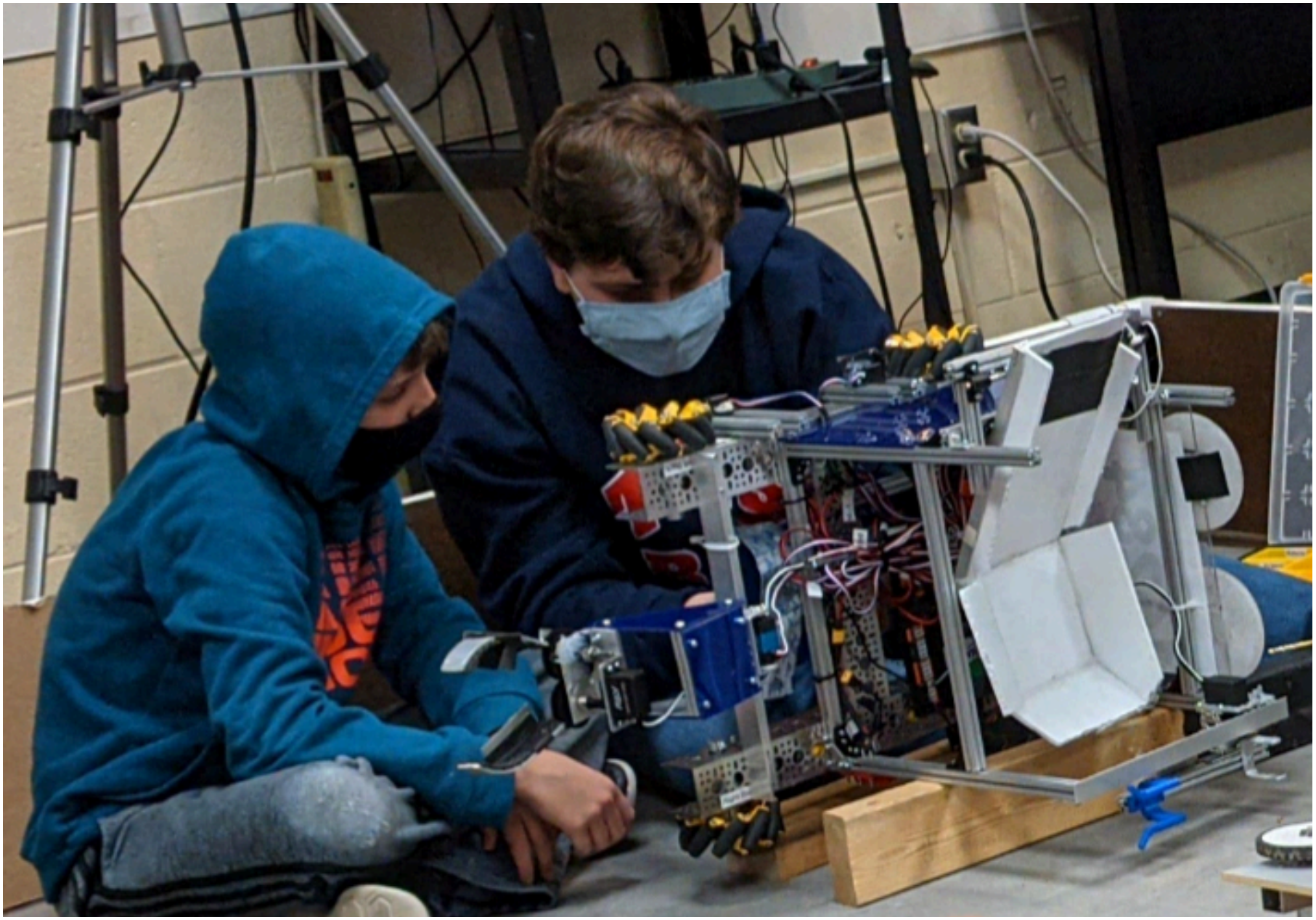
Team Number: 4145

ID-019

Team Name: WorBots

Team Number: 4145

ID-020



Team Name: WorBots

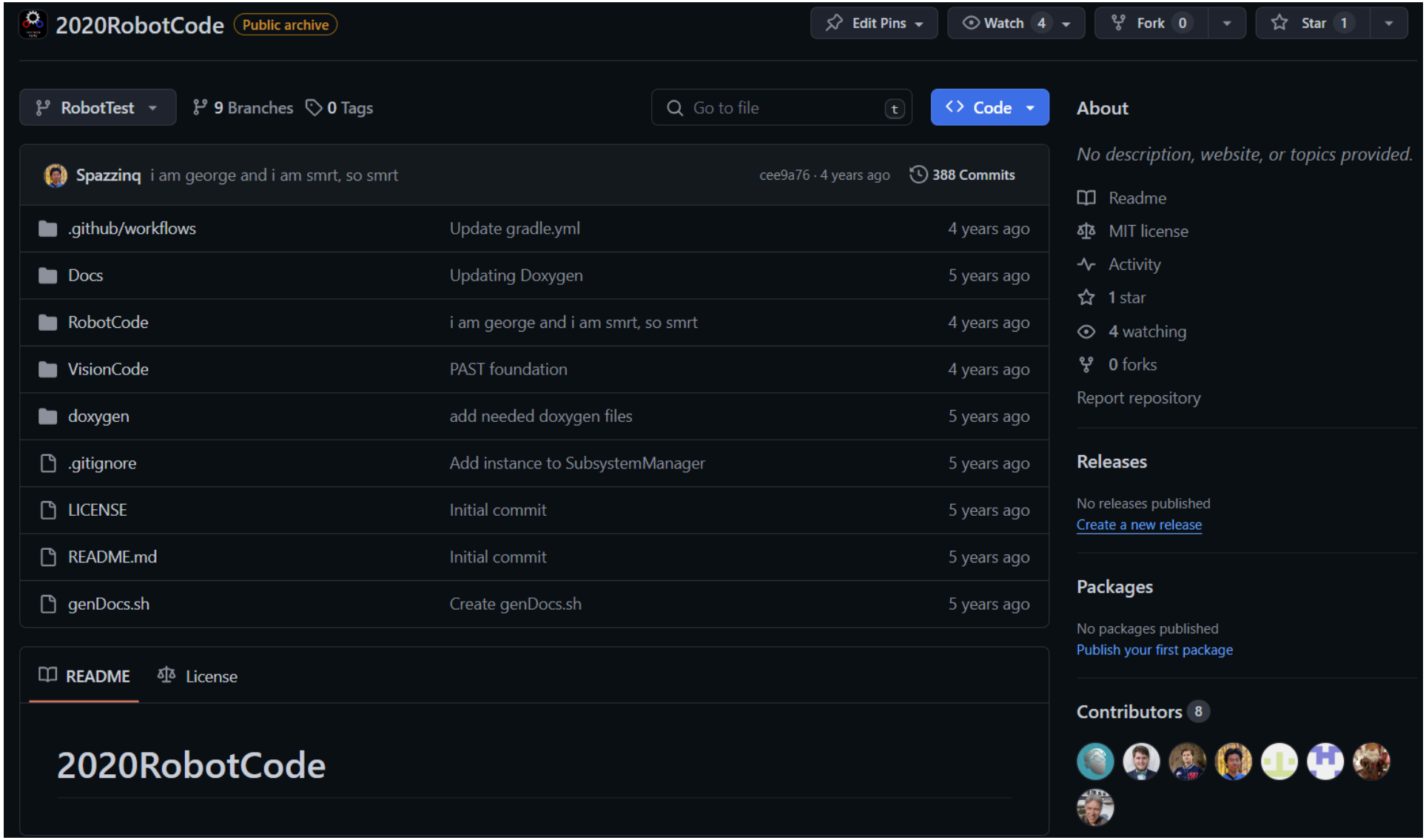
Team Number: 4145

ID-021

Team Name: WorBots

Team Number: 4145

ID-022



Team Name: WorBots

Team Number: 4145

ID-023

Team Name: WorBots

Team Number: 4145

ID-024

Team Name: WorBots

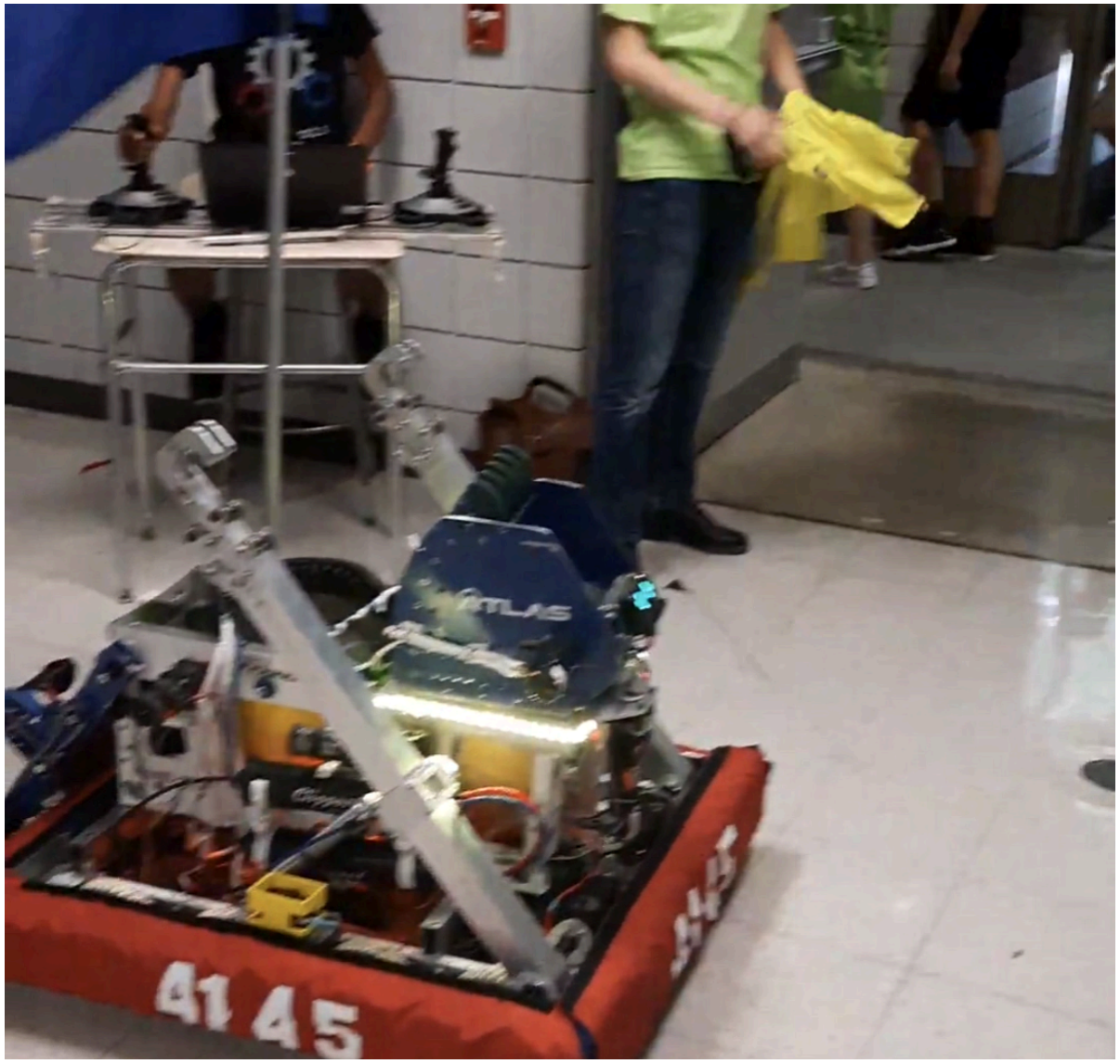
Team Number: 4145

ID-025

Team Name: WorBots

Team Number: 4145

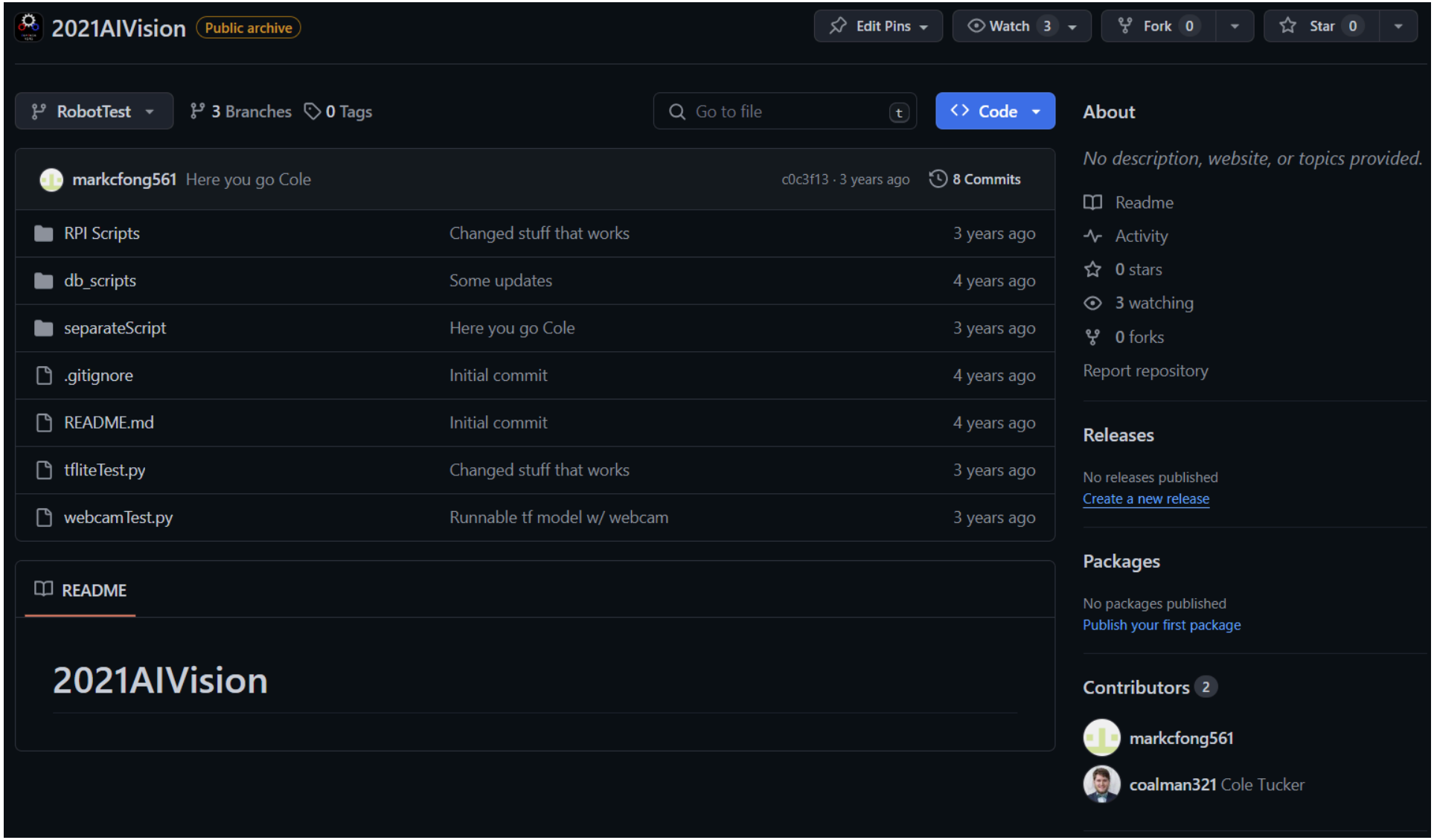
ID-026



Team Name: WorBots

Team Number: 4145

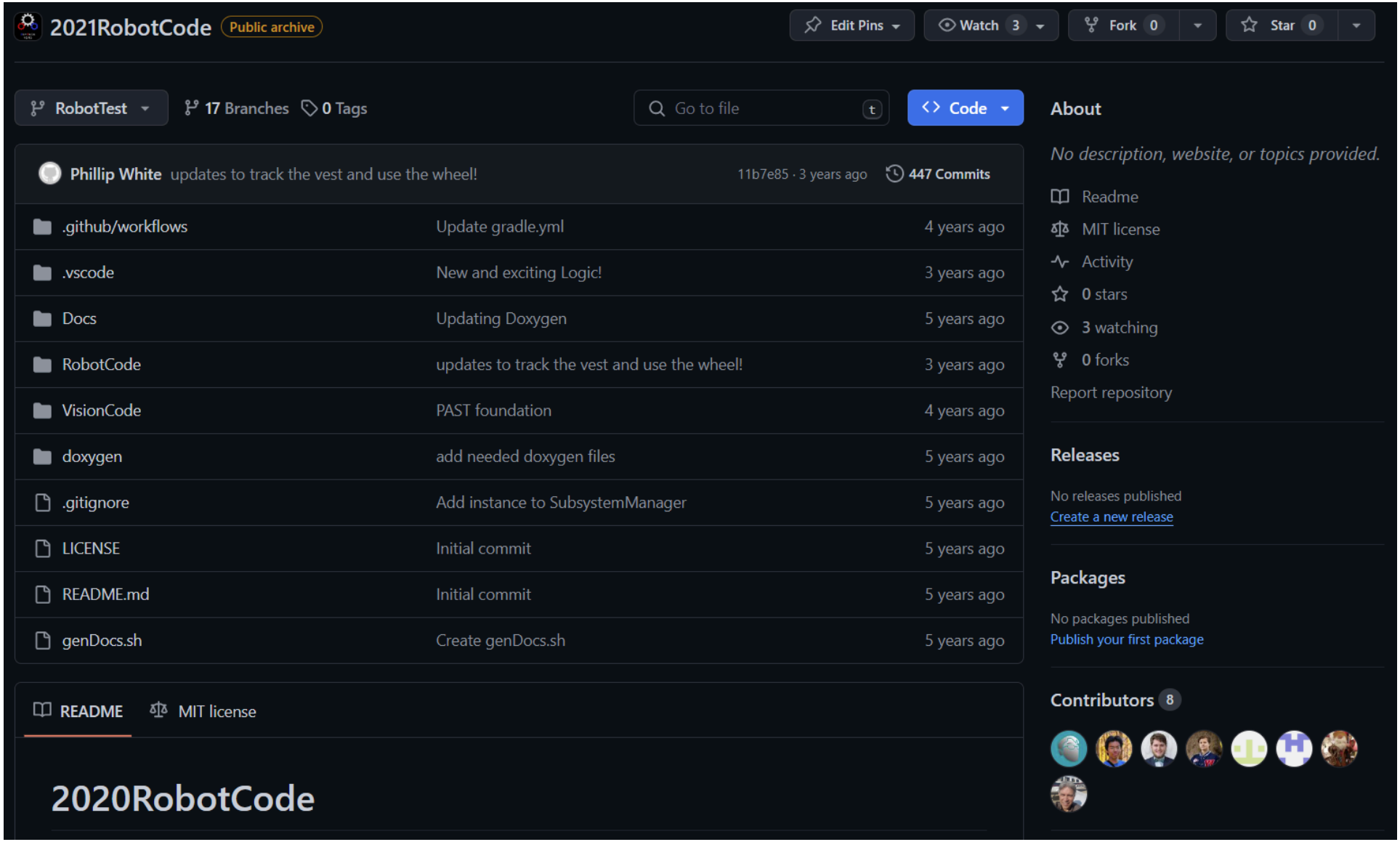
ID-027



Team Name: WorBots

Team Number: 4145

ID-028



Team Name: WorBots

Team Number: 4145

ID-029

Team Name: WorBots

Team Number: 4145

ID-030

https://www.dispatch.com/story/news/local/communities/worthington/2022/01/27/worthington-schools-students-building-career-and-life-skills-on-worbots-robotics-team/9217112002/

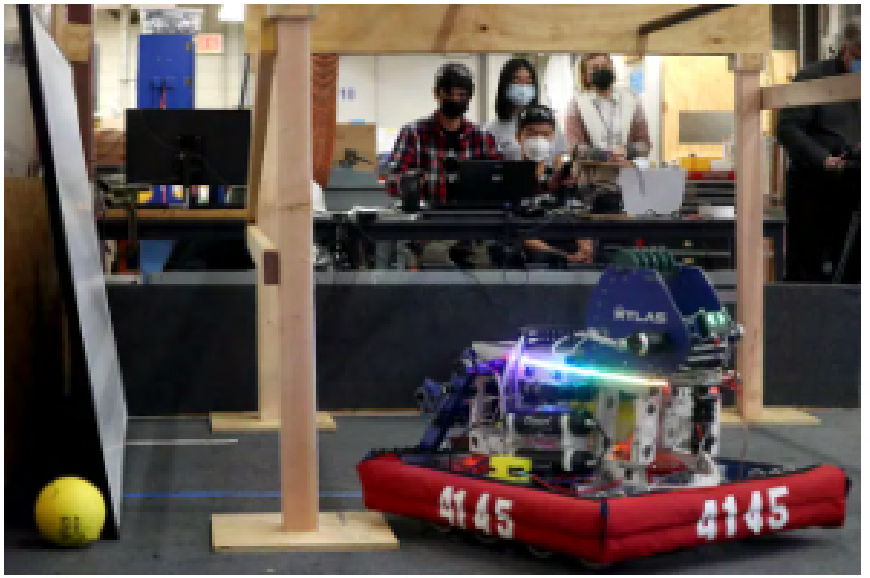
WORTHINGTON

Worthington Schools students building skills for career and life on Worbots robotics team

Stephen Borgna
ThisWeek

Published 3:20 p.m. ET Jan. 27, 2022 | Updated 4:02 p.m. ET Jan. 28, 2022

View Comments



Worthington Kilbourne High School junior Owen Marano (left), lead driver and fabrication lead, pilots Atlas, the Worbots 4145 team's competition robot from 2020, as Kilbourne senior George Fang, programmer, and Kilbourne sophomore Braylee Hiss, business and marketing lead, look on during a demonstration Jan. 25 at Kilbourne. The team includes students from both Kilbourne and Thomas Worthington High School. Shane Flanigan/ThisWeek

Four days a week after school and on Saturdays, a group of students from Worthington Kilbourne and Thomas Worthington high schools make their way to a workshop at Kilbourne.

There, instead of playing sports or instruments or doing other extracurricular activities, they build robots.

The 43 students comprise Worbots 4145, a Worthington Schools robotics team that builds and programs robots to compete in annual international FIRST Robotics Competition events, which draw thousands of robotics teams and high schoolers

Team Name: WorBots

Team Number: 4145

ID-031

Team Name: WorBots

Team Number: 4145

ID-032

The Worthington Robotics Team

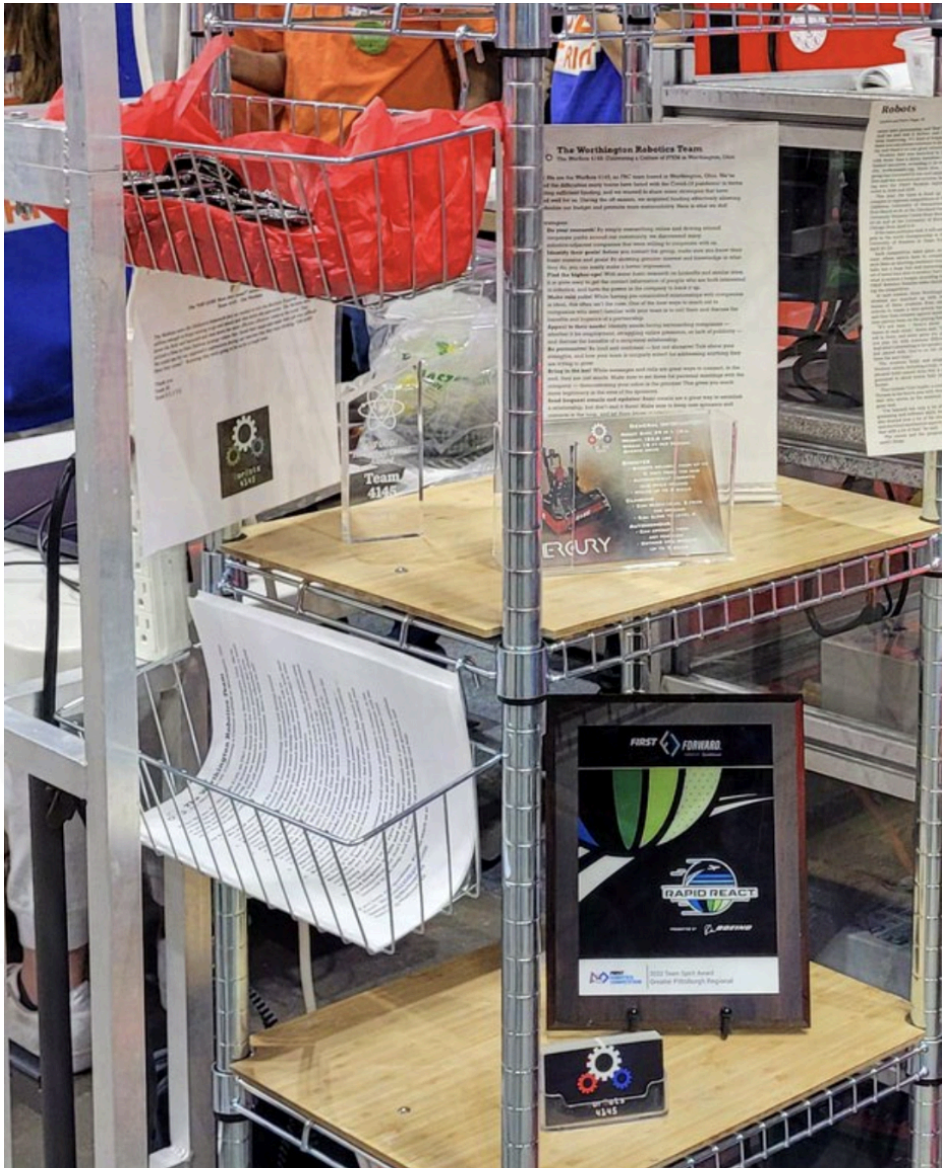
The WorBots 4145: Cultivating a Culture of STEM in Worthington, Ohio

Hello! We are the WorBots 4145, an FRC team based in Worthington, Ohio. We've noticed the difficulties many teams have faced with the Covid-19 pandemic in terms of getting sufficient funding, and we wanted to share some strategies that have worked well for us. During the off-season, we acquired funding effectively allowing us to double our budget and promote team sustainability. Here is what we did!

Key Strategies:

1. **Do your research!** By simply researching online and driving around corporate parks around our community, we discovered many robotics-adjacent companies that were willing to cooperate with us.
2. **Identify their goals!** Before you contact the group, make sure you know their basic mission and goals! By showing genuine interest and knowledge in what they do, you can easily make a better impression.
3. **Find the higher-ups!** With some basic research on LinkedIn and similar sites, it is quite easy to get the contact information of people who are both interested in robotics, and have the power in the company to back it up.
4. **Make cold calls!** While having pre-established relationships with companies is ideal, this often isn't the case. One of the best ways to reach out to companies who aren't familiar with your team is to call them and discuss the benefits and logistics of a partnership.
5. **Appeal to their needs!** Identify needs facing surrounding companies — whether it be employment, struggling online presence, or lack of publicity — and discuss the benefits of a reciprocal relationship.
6. **Be persuasive!** Be loud and confident — but not abrasive! Talk about your strengths, and how your team is uniquely suited for addressing anything they are trying to grow.
7. **Bring in the bot!** While messages and calls are great ways to connect, in the end, they are just words. Make sure to set dates for personal meetings with the company — demonstrating your robot in the process! This gives you much more legitimacy in the eyes of the sponsors.
8. **Send frequent emails and updates!** Basic emails are a great way to establish a relationship, but don't end it there! Make sure to keep new sponsors and contacts in the loop, and let them know of any ways they can help.

If you have any questions, you can reach us at:
Email: Worbots4145@gmail.com
Instagram: @Worbots4145
Twitter: @Worbots4145



Team Name: WorBots

Team Number: 4145

ID-033

The Worthington Robotics Team

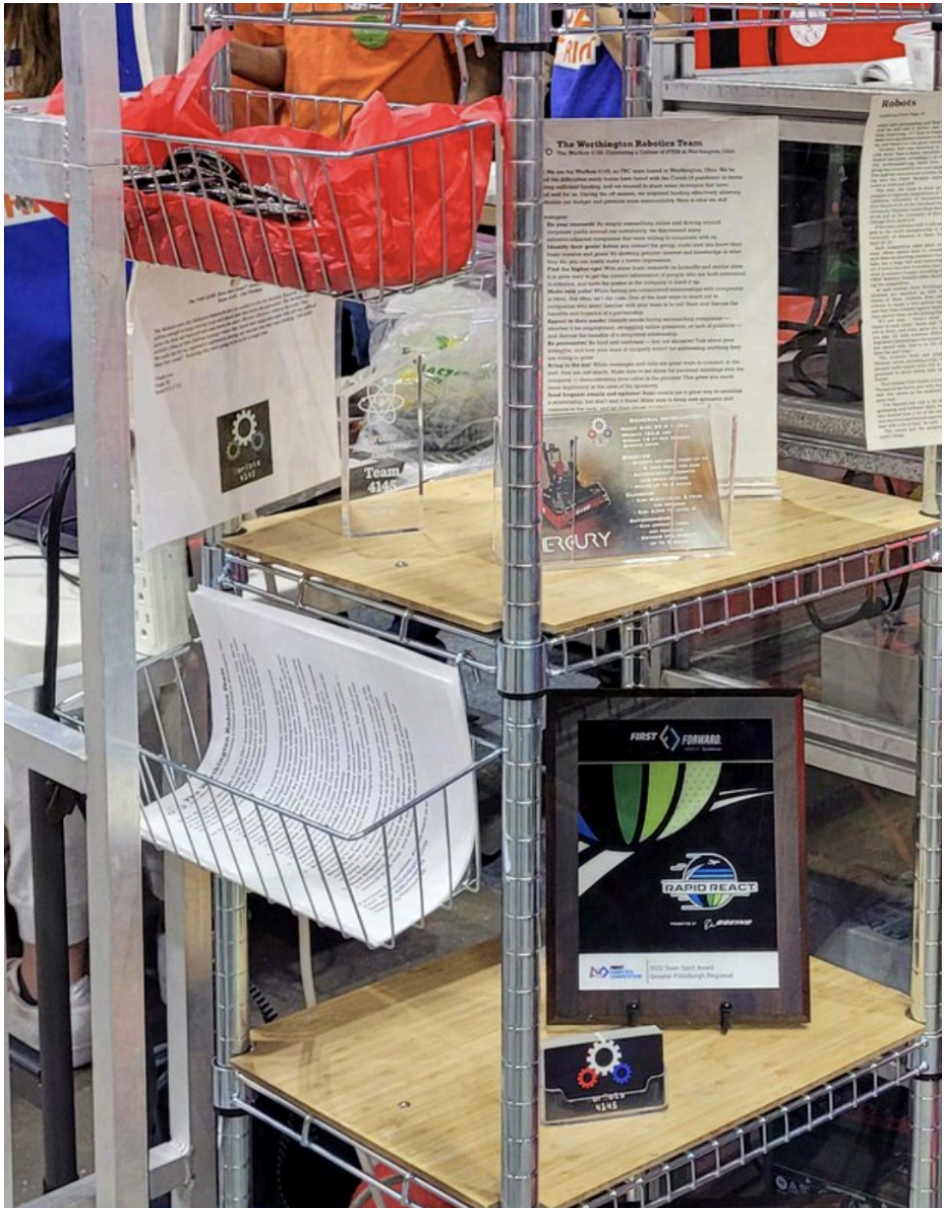
The WorBots 4145: Cultivating a Culture of STEM in Worthington, Ohio

Hello! We are the WorBots 4145, a team based in Worthington, Ohio. With COVID-19 decimating a lot of teams' numbers, including our own, we wanted to share some strategies that have helped us bounce back quickly from the pandemic, and that will hopefully work for your team as well.

Key Strategies:

1. **Contact the Administration!** By working with the administration of the schools your team comes from, you can get on the announcements, participate in school events, and get free advertising at other events as well. Having the administration on your side benefits all other recruiting methods!
2. **Reach outside STEM!** An FRC Team is not only for students that are already participating in STEM programs, and there are a multitude of awards for fields in art, business, and graphic design. Reach out to the business and arts programs at your school, and your team will have a wider skill set to pull from.
3. **Contact Teachers!** Teachers can be the link between your team and the general school population, or even help as mentors for your team! Taking the time to have a conversation could boost your team for years to come.
4. **Make Posters!** How are students going to know your team if they aren't reminded? Make some fun designs and summaries that they will walk by each day, and watch the students roll on in. Having some name awareness around your school is key to having a successful team.
5. **Meet With Younger Grades!** Our team has had a lot of success with bringing our robot to STEM days in our nearby middle and elementary schools, and doing simple demonstrations. While it does not immediately benefit your numbers, interested students will soon move up to join!
6. **Set Up Feeder Teams!** While it takes a lot of effort, having a more solid pathway of robotics K-12 can really boost your team to another level! Not only will more people come into your team, they will also already have some basic skills and knowledge about robotics.
7. **Get a Social Media Presence!** Make sure your team has some basic accounts set up on the major platforms, so that you can share competition and workshop photos! If you do it well, you can not only get student recognition, but also parental knowledge and support!

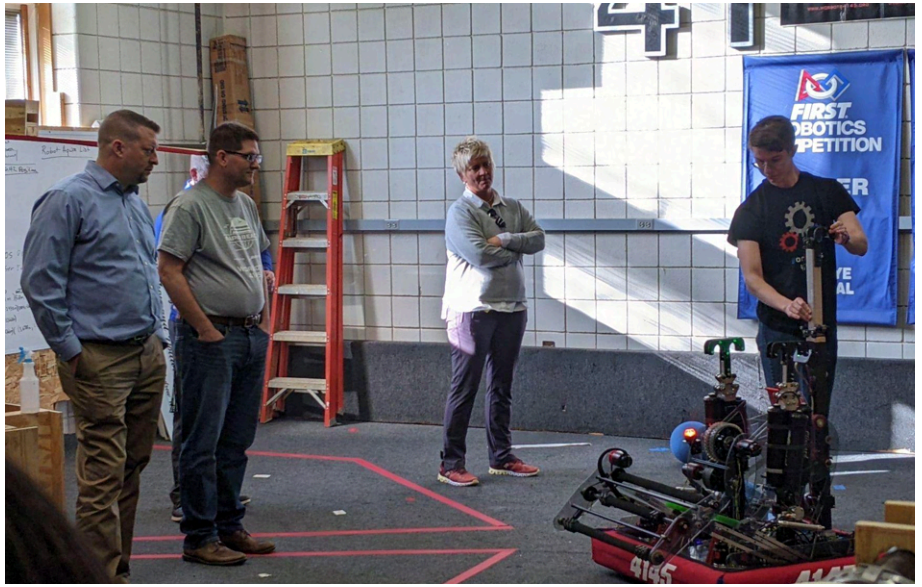
If you have any questions, you can reach us at:
Email: Worbots4145@gmail.com
Instagram: @Worbots4145
Twitter: @Worbots4145



Team Name: WorBots

Team Number: 4145

ID-034



Team Name: WorBots

Team Number: 4145

ID-035

Worbots 4145 Follow Up Meeting

When **Changed:** Mon Mar 14, 2022 3:30pm – 4:30pm Eastern Time - New York **more details »**

Calendar nd0104@wscloud.org

Who
- Aric Thomas - organizer
- rmessenheimer@wscloud.org
- Neil Gupta
- Angela Adrean
- yh0612@wscloud.org
- ts0159@wscloud.org
- nd0104@wscloud.org

I am proposing we meet on Monday, March 14th and follow up with the Worbots presenters--Braylee, Toby, and Natalie. We would meet as soon as Braylee and Natalie arrived from TWHS in my office. Please let me know if you are unable to attend. I know we are working with several schedules.

Sincerely,
Aric Thomas

Team Name: WorBots

Team Number: 4145

ID-036

Team Name: WorBots

Team Number: 4145

ID-037

Team Name: WorBots

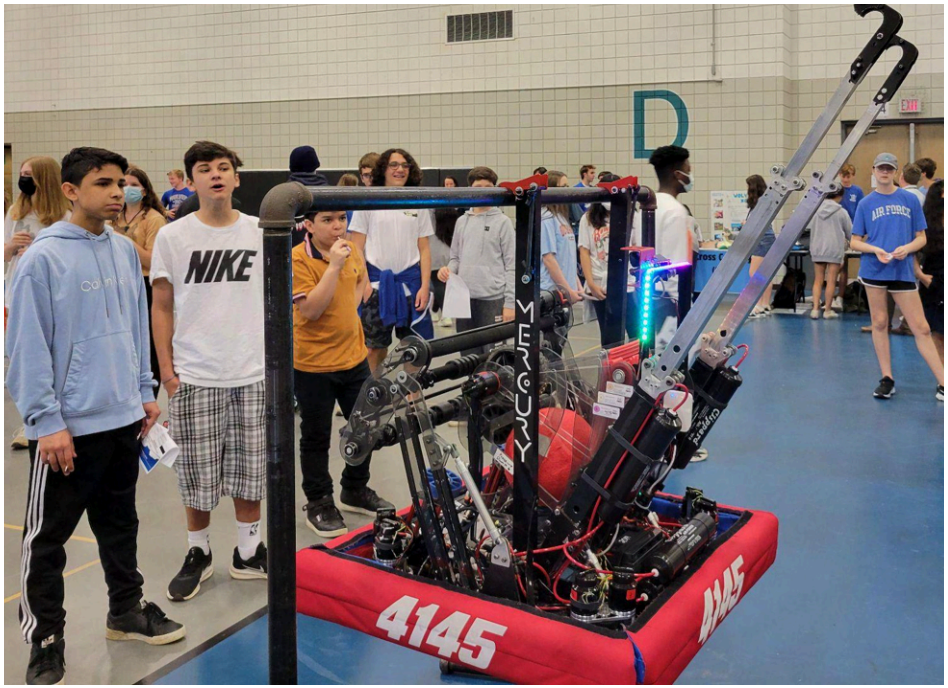
Team Number: 4145

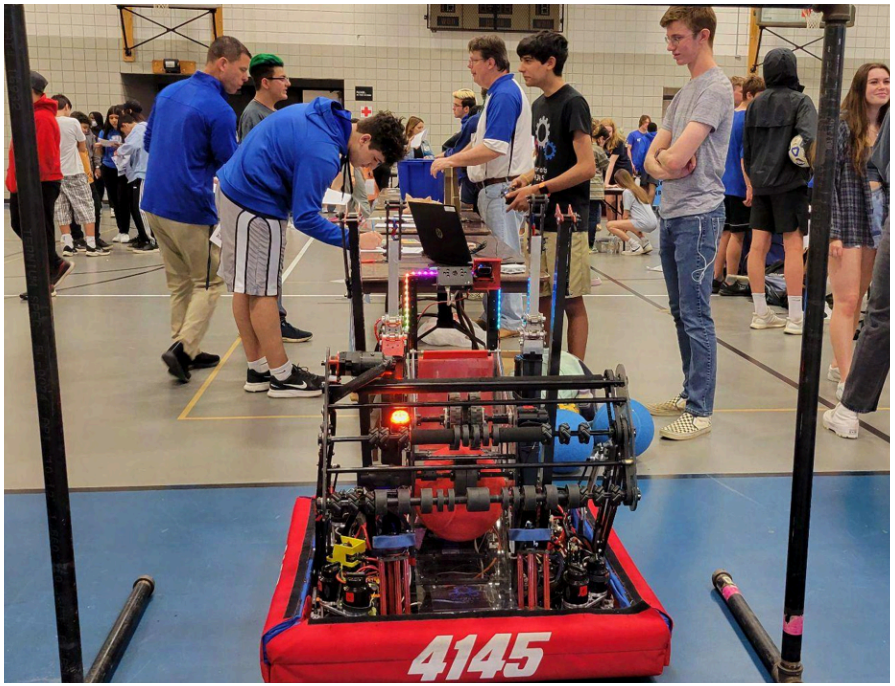
ID-038

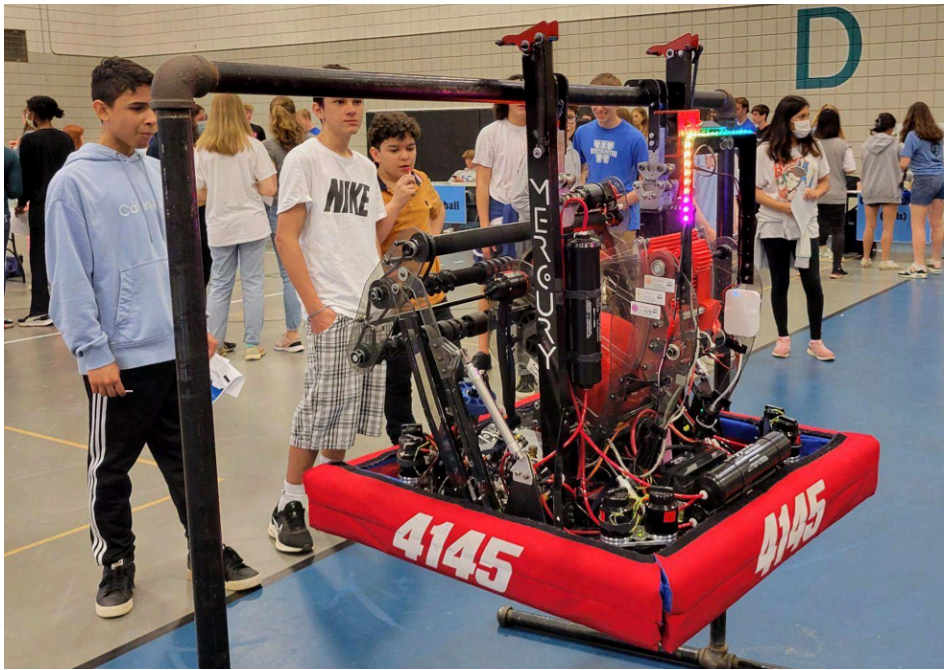
Team Name: WorBots

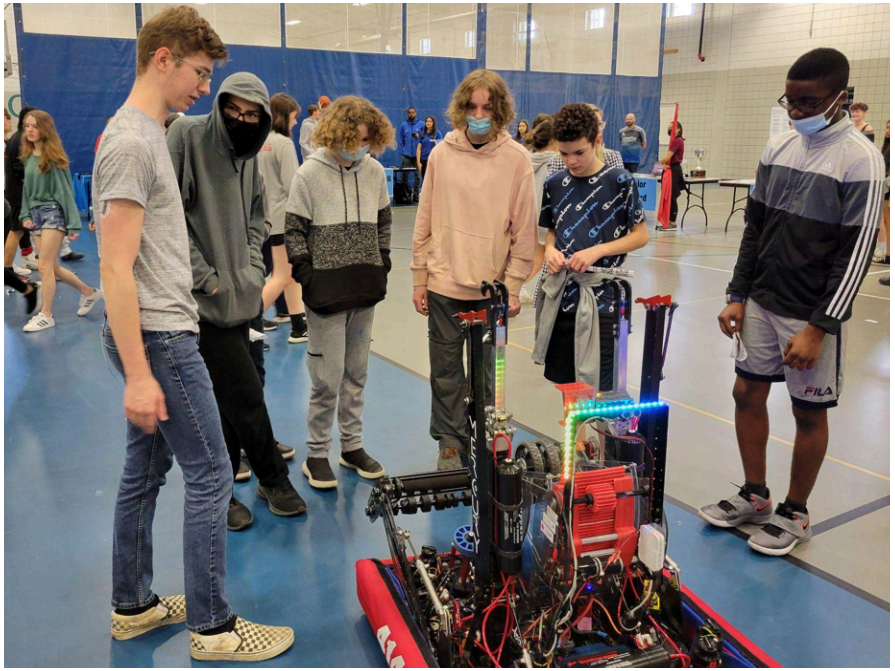
Team Number: 4145

ID-039









Team Name: WorBots

Team Number: 4145

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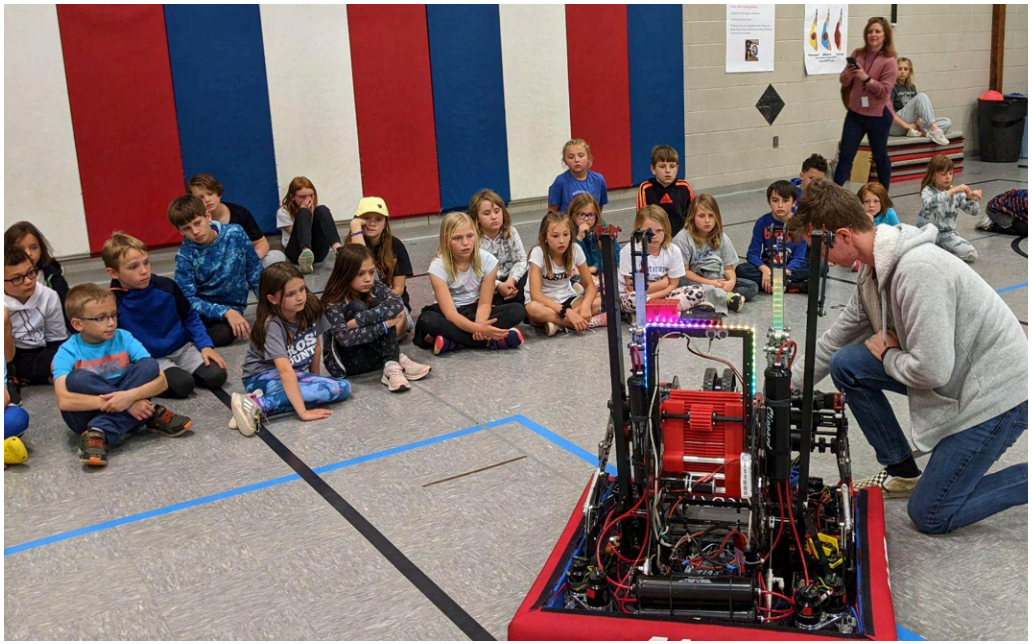


Team Name: WorBots

Team Number: 4145

ID-041

Team Name: WorBots

Team Number: 4145

ID-042

Team Name: WorBots

Team Number: 4145

ID-043

Team Name: WorBots

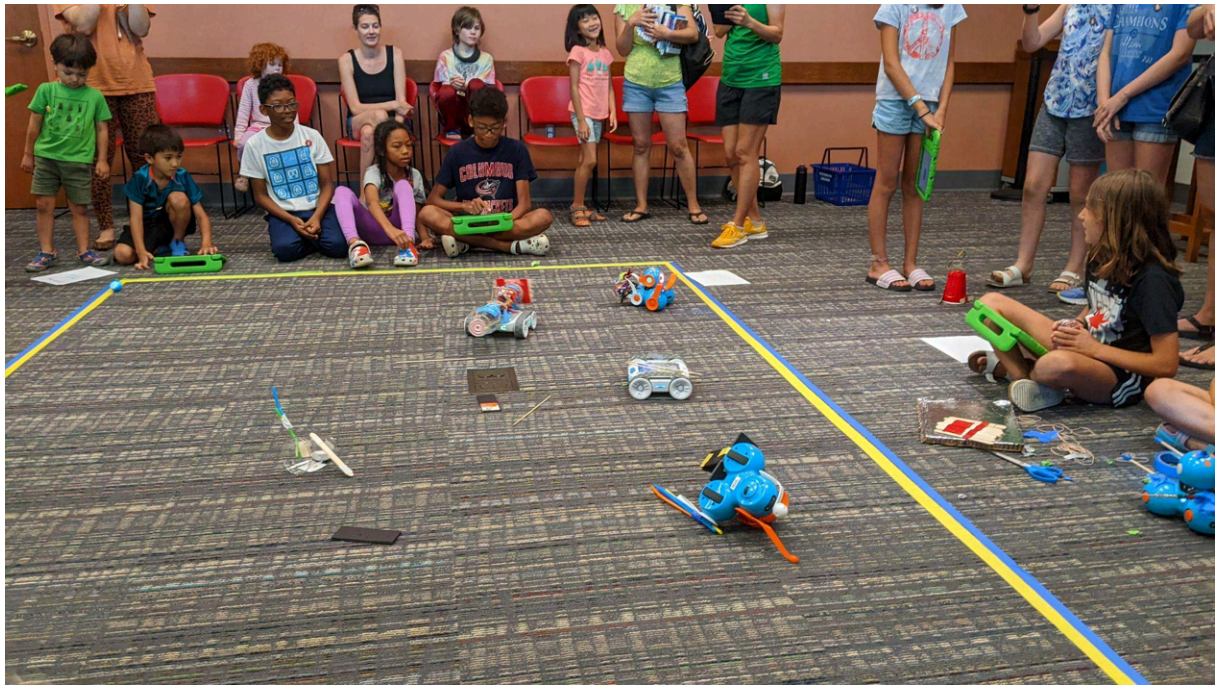
Team Number: 4145

ID-044

Team Name: WorBots

Team Number: 4145

ID-045



Team Name: WorBots

Team Number: 4145

ID-046

Team Name: WorBots

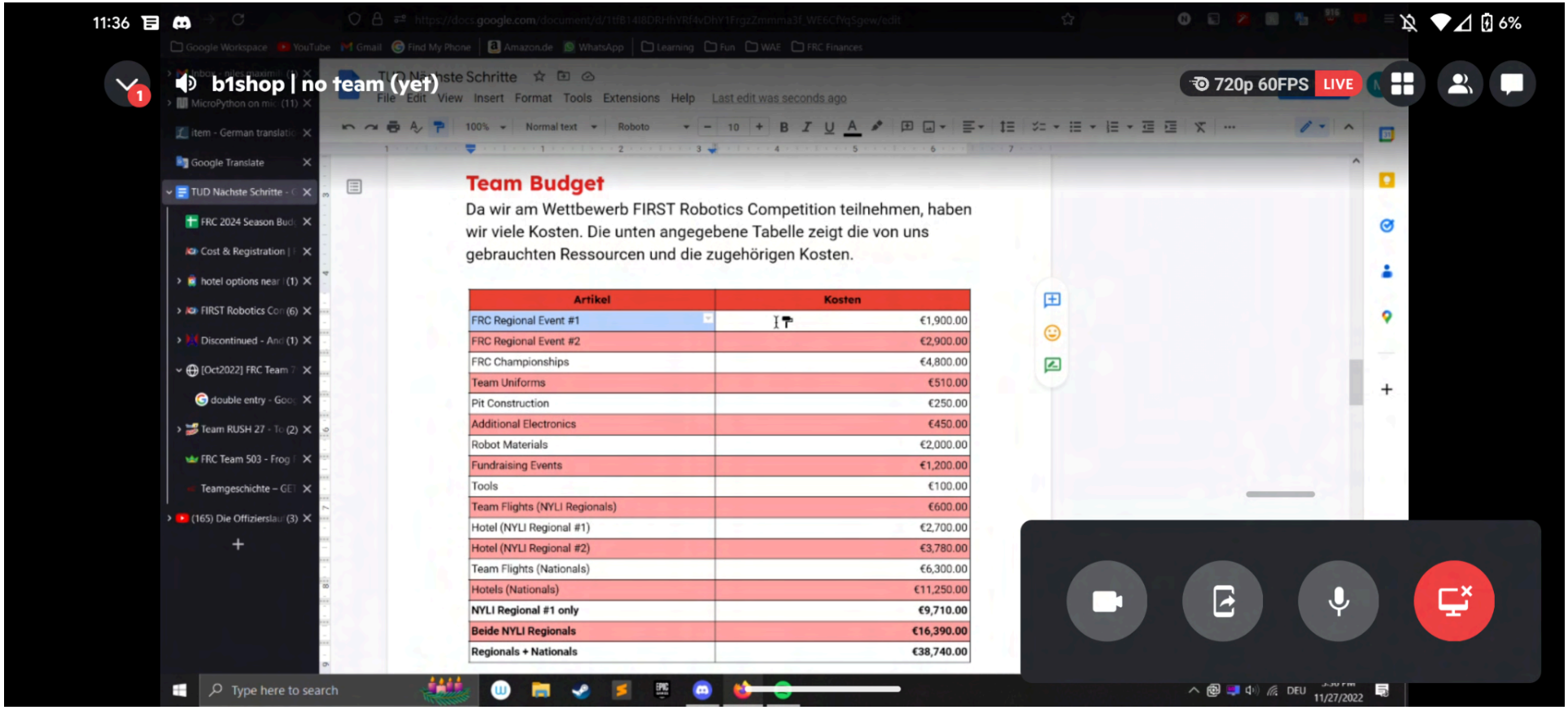
Team Number: 4145

ID-047

Team Name: WorBots

Team Number: 4145

ID-048



Team Name: WorBots

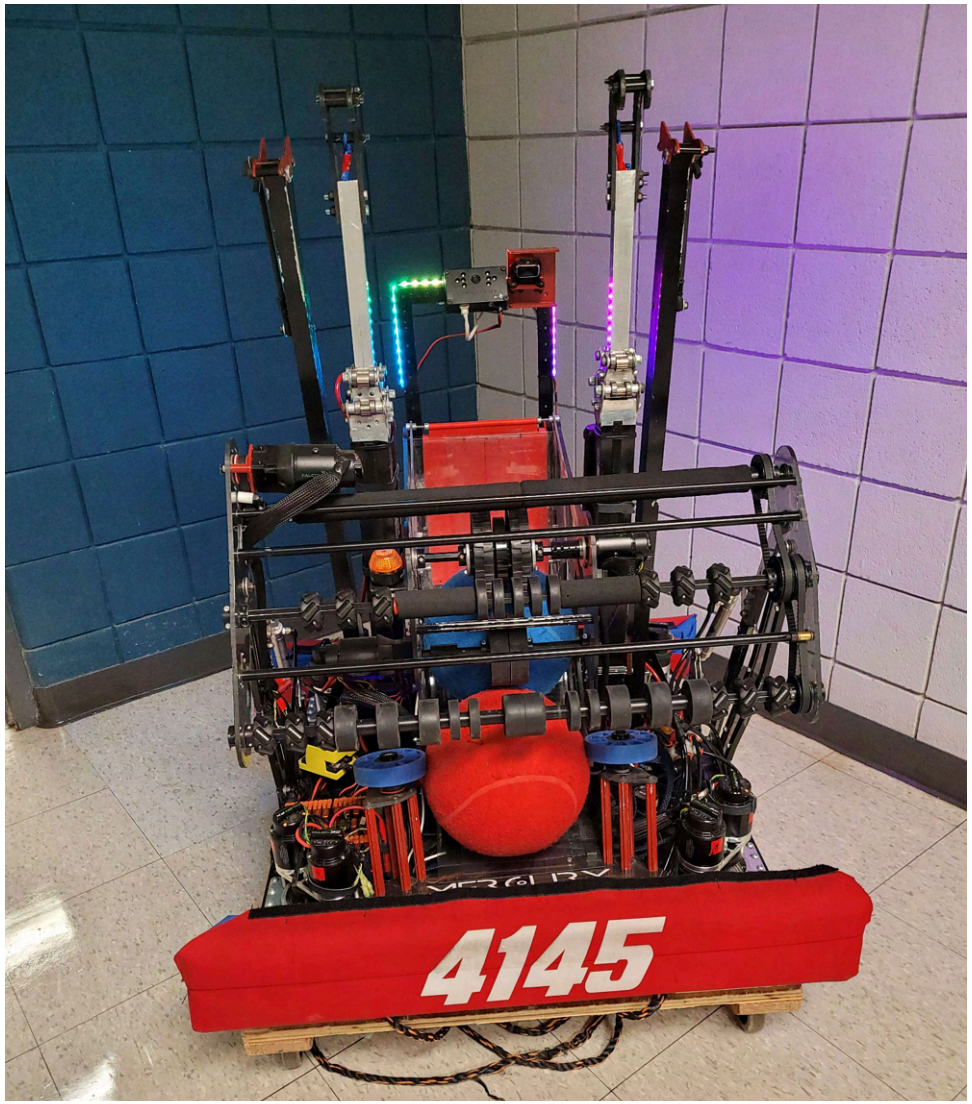
Team Number: 4145

ID-049

Team Name: WorBots

Team Number: 4145

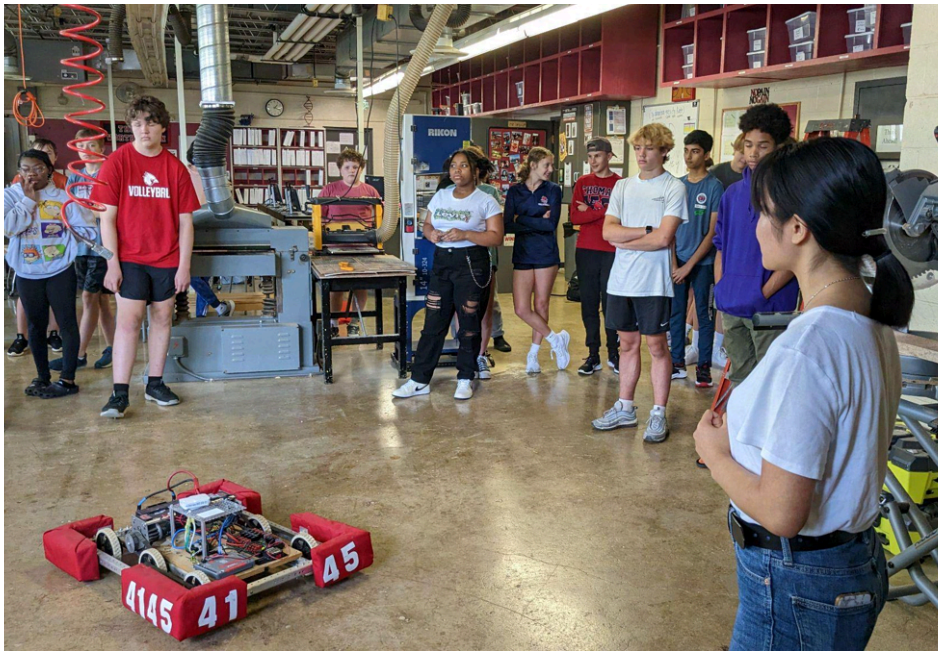
ID-050



Team Name: WorBots

Team Number: 4145

ID-051



Team Name: WorBots

Team Number: 4145

ID-052

Team Name: WorBots

Team Number: 4145

ID-053

The Worthington Robotics Team

Students from Thomas and Worthington Kilbourne High School join together as the Worthington Robotics Team to compete in the *FIRST®* Robotics Competition. Best described as a *sport for the mind*, this international competition is not for the faint of heart. Each season, over the course of six weeks, students design, build, and program a life-sized robot to compete on a massive field with their team alliance.

Each team has its own structure, with a subset of members working on tasks such as public relations, business, programming, fabrication, pneumatics, electrical, and more! Teams travel with their robot to local competitions throughout the U.S. to qualify for Worlds, the championship event often held in Detroit, Michigan.

In 2022, The WorBots designed an over 100 pound robot that could intake, carry, and shoot oversized tennis balls into a over 8-foot high basket, maneuver with complex code systems and target with AI vision programs, then climb and traverse 4 rungs at the finale.

Interested in the program? Students are welcome to join us at our first informational meeting on Wednesday, October 19th right after school. The meeting will be held at our workshop at WKHS in room 146. Bus 55 will be available to ferry TWHS students.

The WorBots 2022 Robot, Mercury

WorBots Competition

Team Name: WorBots

Team Number: 4145

ID-054

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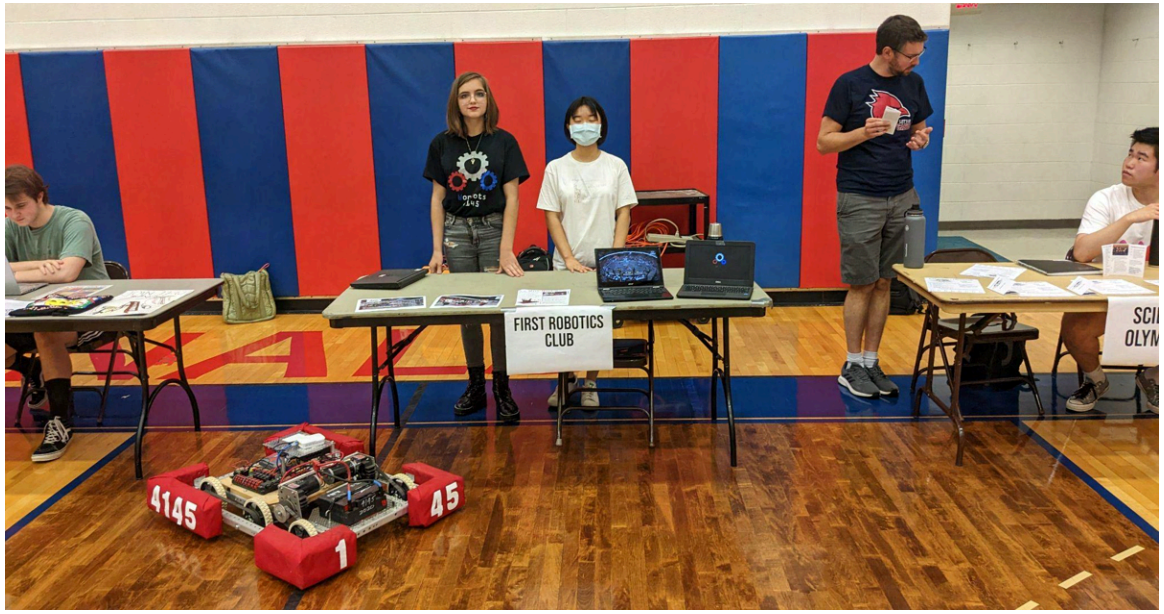
Team Number: 4145

ID-055



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Team Number: 4145

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Team Name: WorBots

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Team Name: WorBots

Team Number: 4145

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Team Name: WorBots

Team Number: 4145

ID-060

Hsu, Yuan <yh0612@wscloud.org>
to Karrie, me

Fri, Aug 5, 11:12 AM

Hi Mrs. Mowery!

Glad you got the information! Early September sounds like a good time to start. I am not sure on the details about availability for our high school members, but I will be meeting with some team members next week, so I will add that to our agenda. I already have a couple people in mind. As for myself, I can come in 2 times a week any day after 4:00pm. (I will try to find another mentor who can drive so I can get there earlier!)

Thanks for updating us on the kits and laptops. When would you like the high school team to send over the check for $450?

So excited that we have 3 potential coaches!! I will be looking forward to meeting them :) Hopefully by then I will have a couple high schoolers confirmed to mentor the team so we can all meet in-person.

I might have mentioned this in a previous email, but Mr. Karns said we will need at least one teacher to act as a connection between Wilson Hill and the FLL teams. I was wondering if you could do that Mrs. Mowery? You have already been great at communicating with everyone and setting up meetings! You will not have to be at practices very often; it will mainly be the communication piece.

Thanks!

Braylee

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*** This Email has Been Sent from a High School Student Account ***

Team Name: WorBots

Team Number: 4145

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Team Name: WorBots

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Team Name: WorBots

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Team Number: 4145

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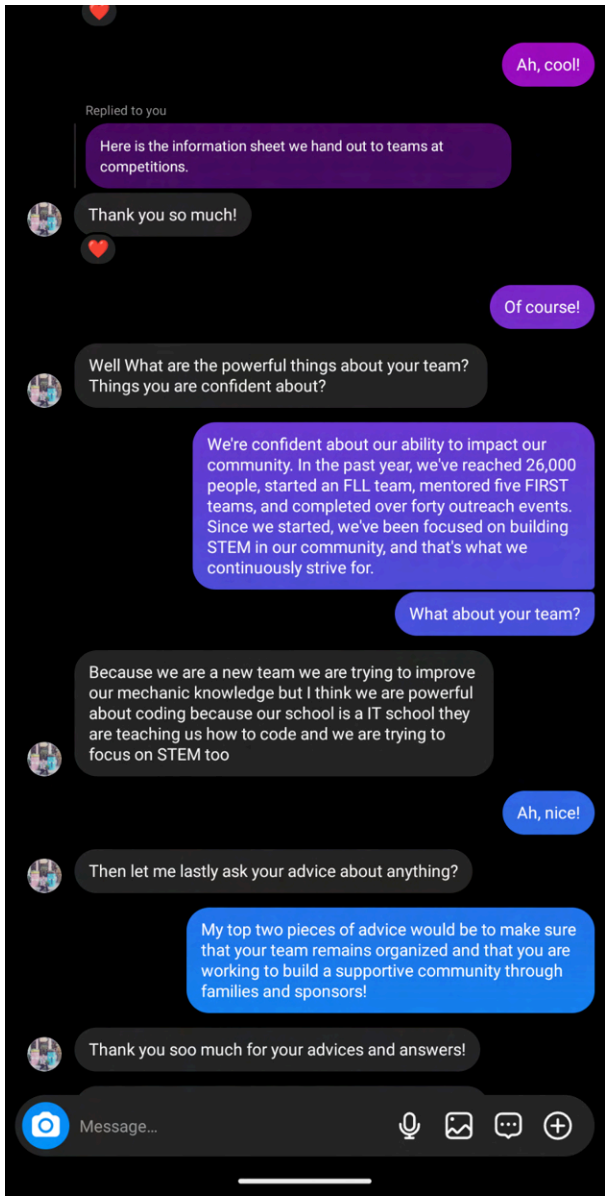

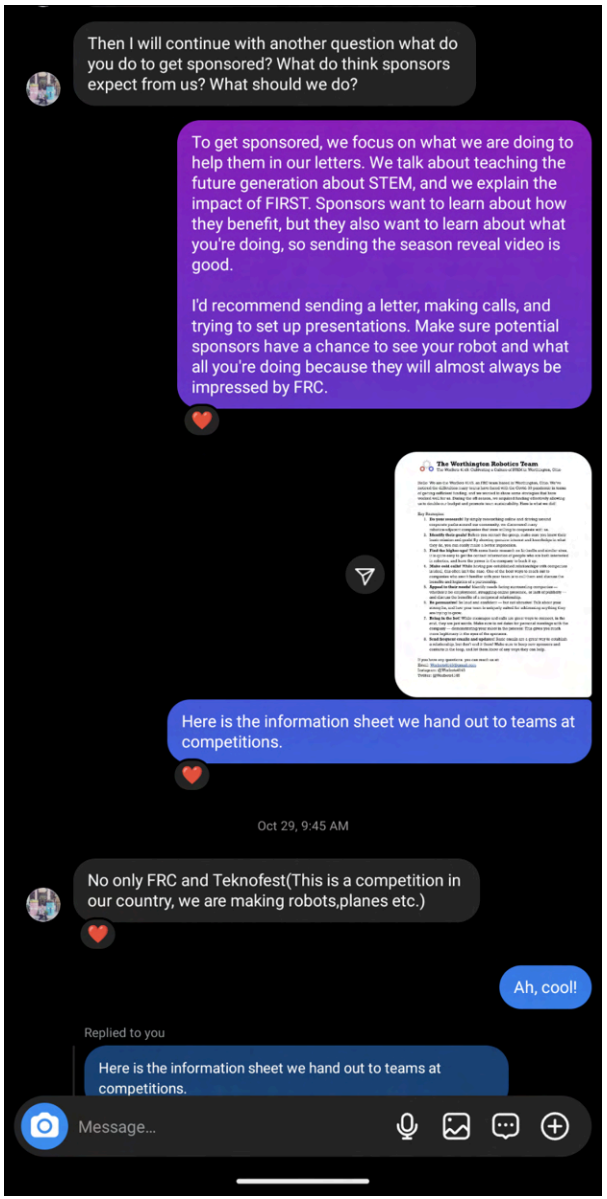

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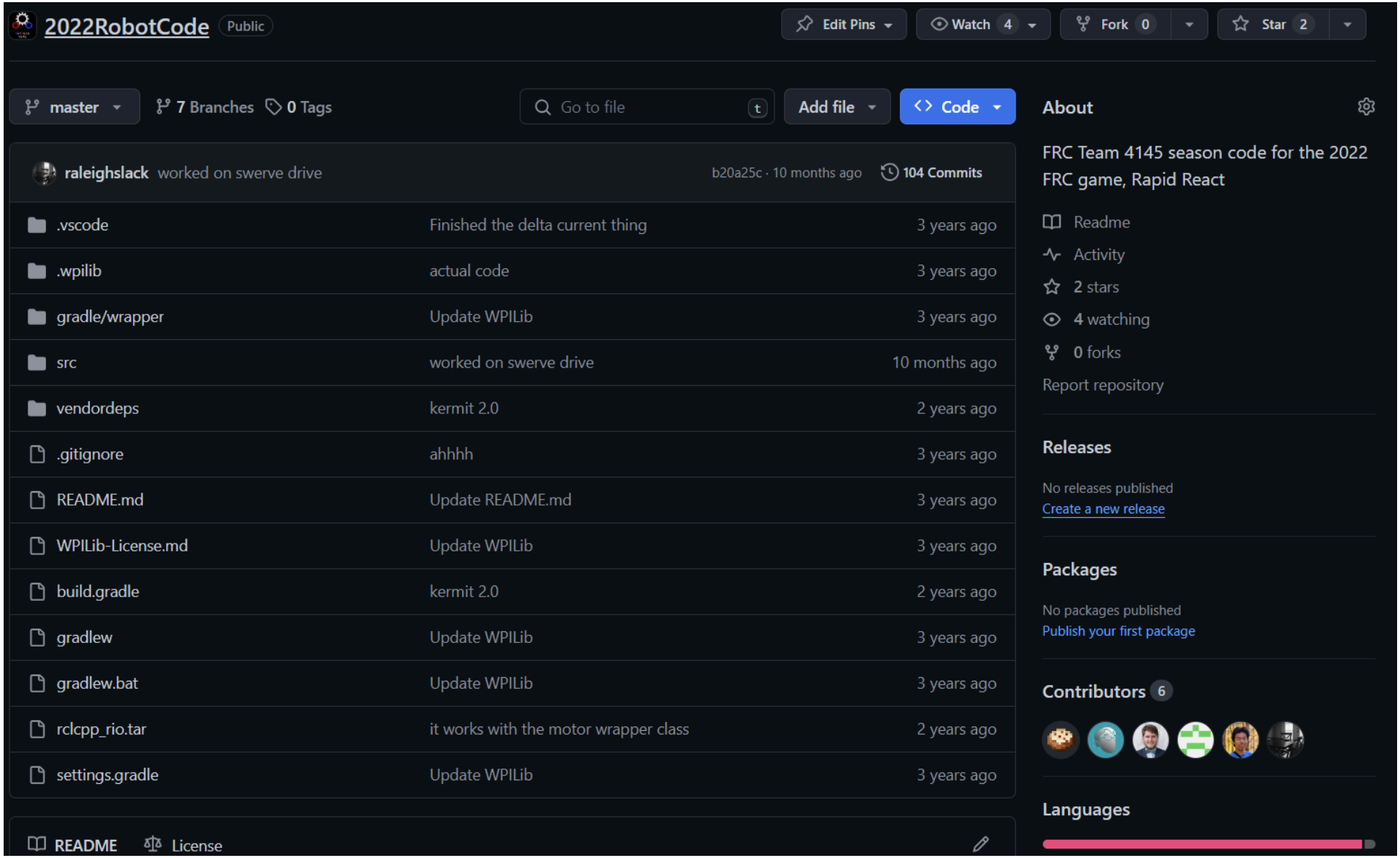

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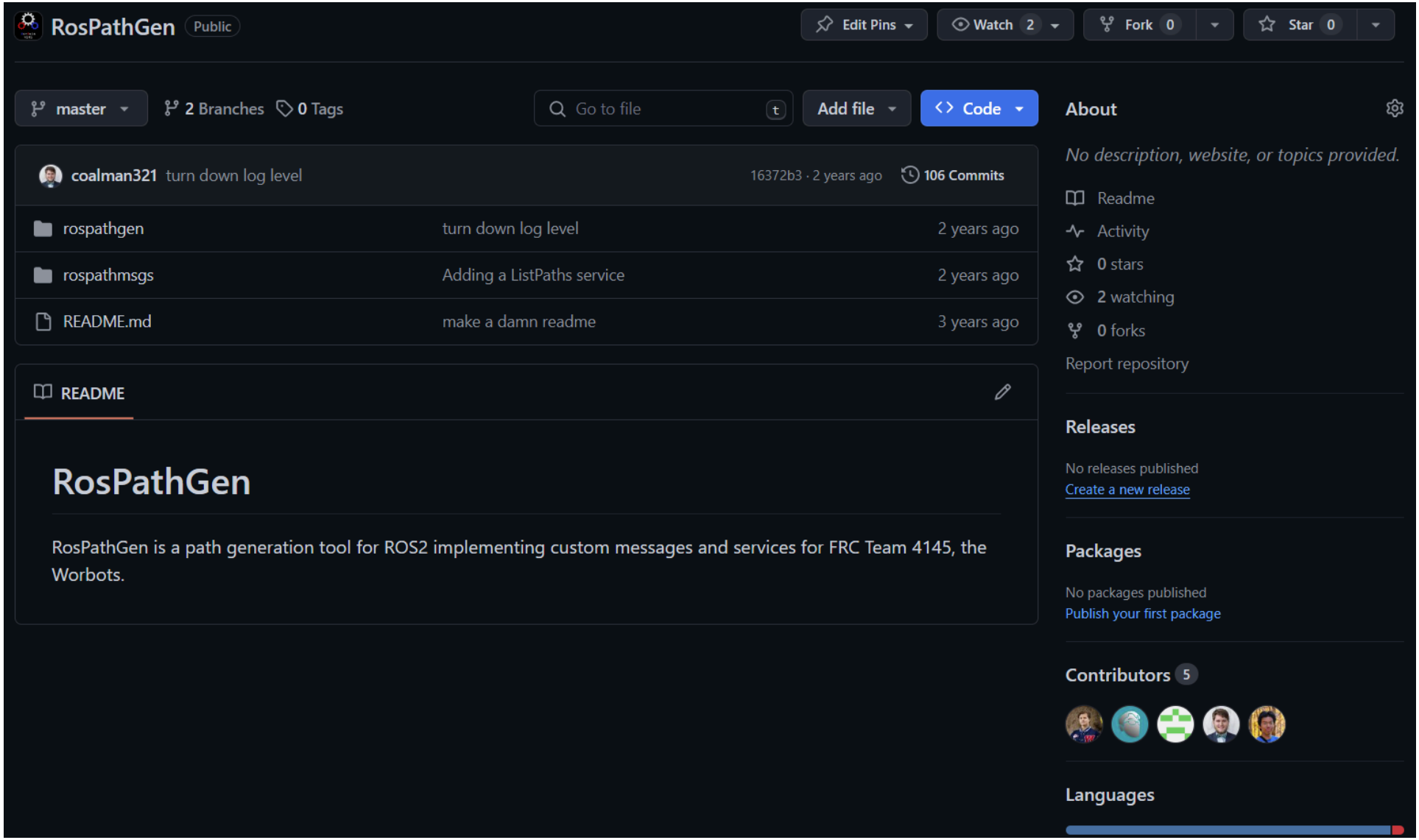

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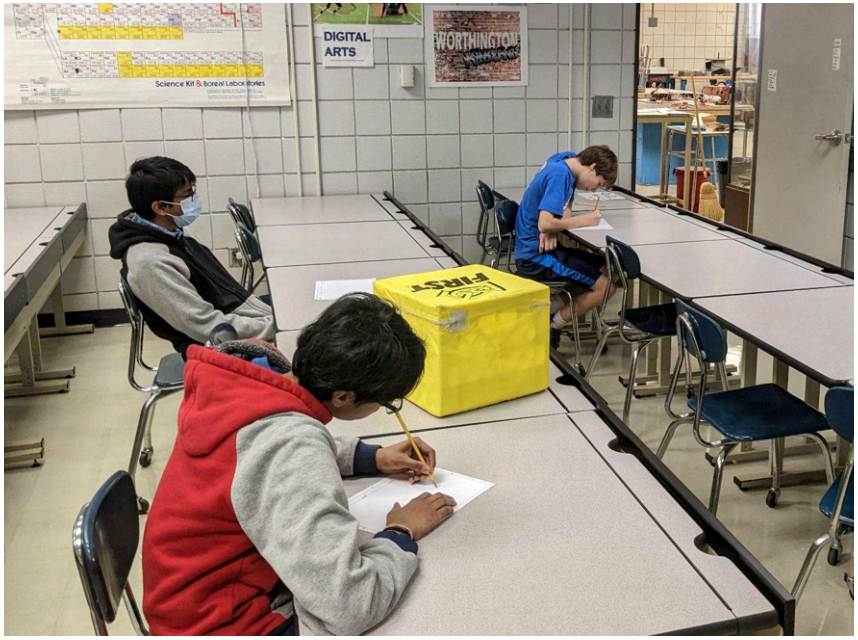

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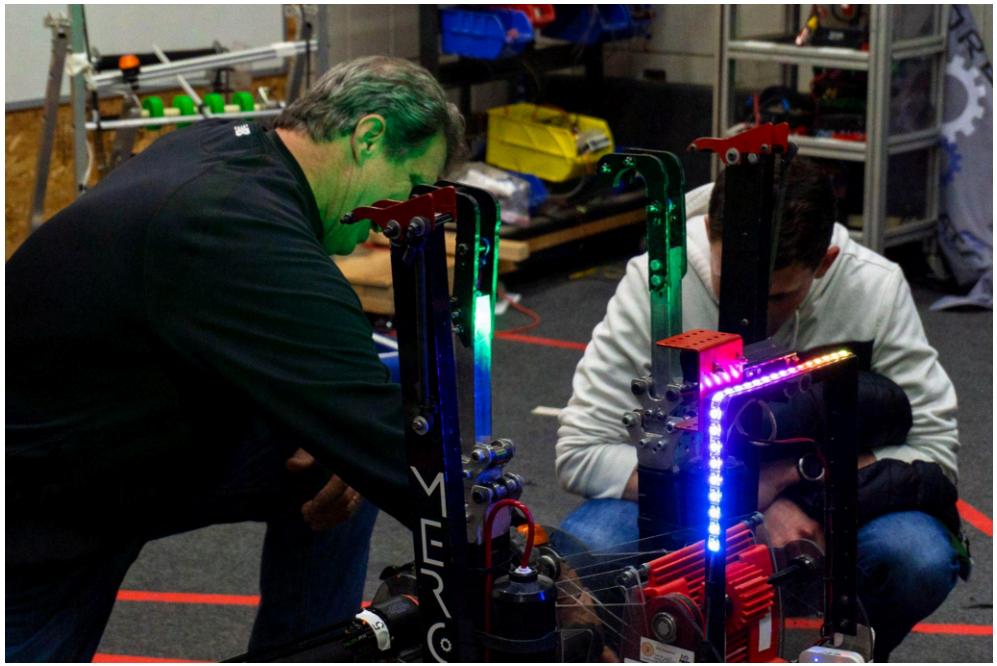

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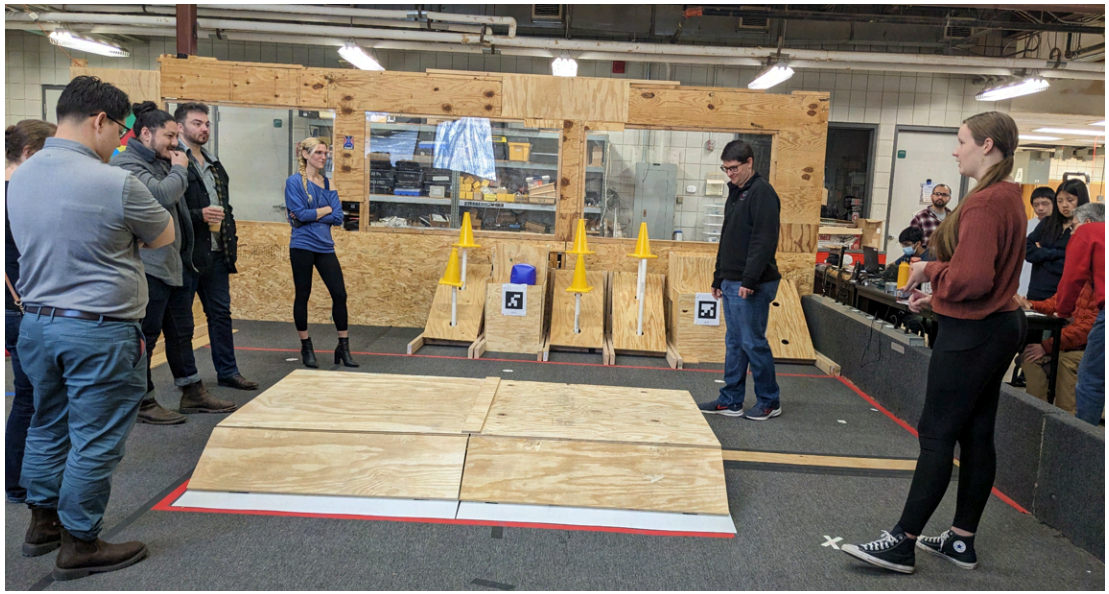

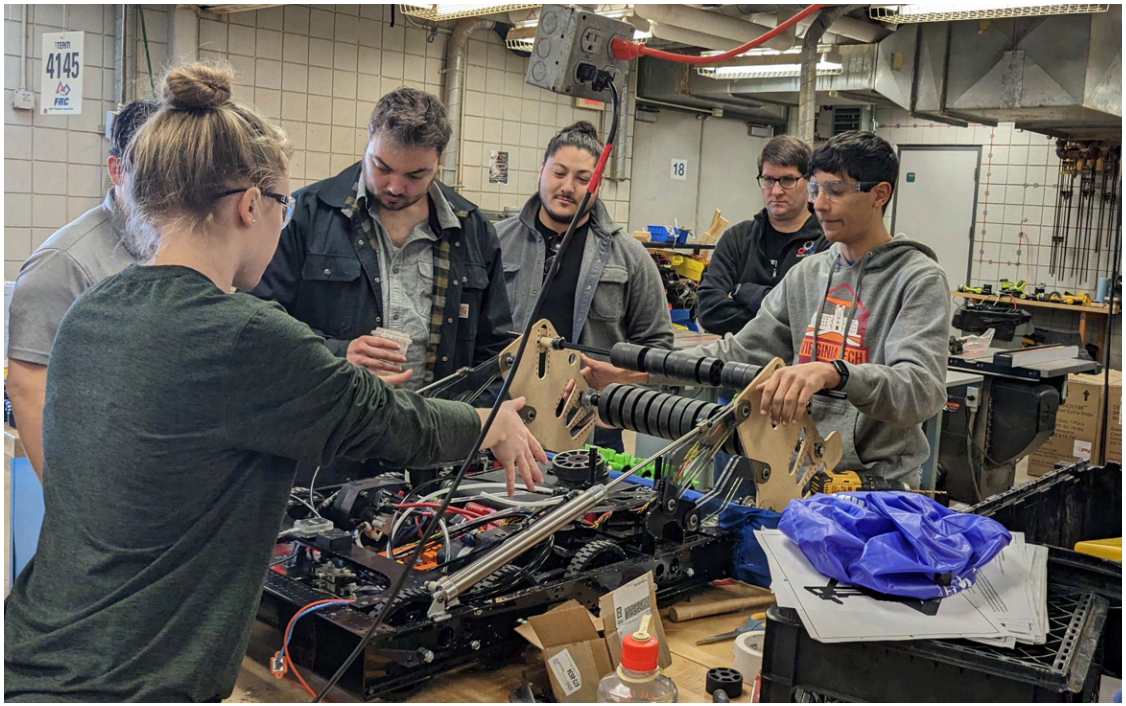

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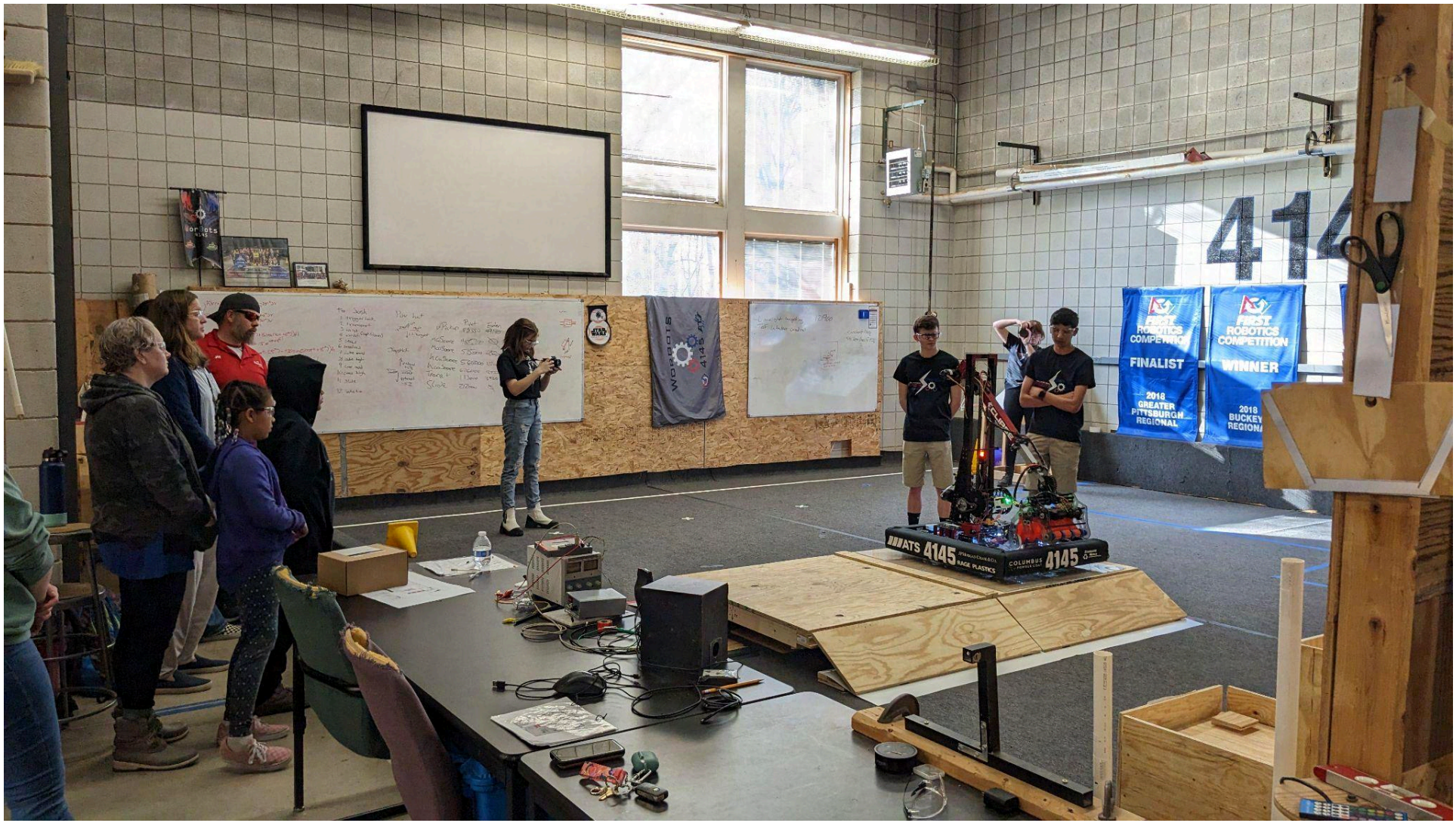

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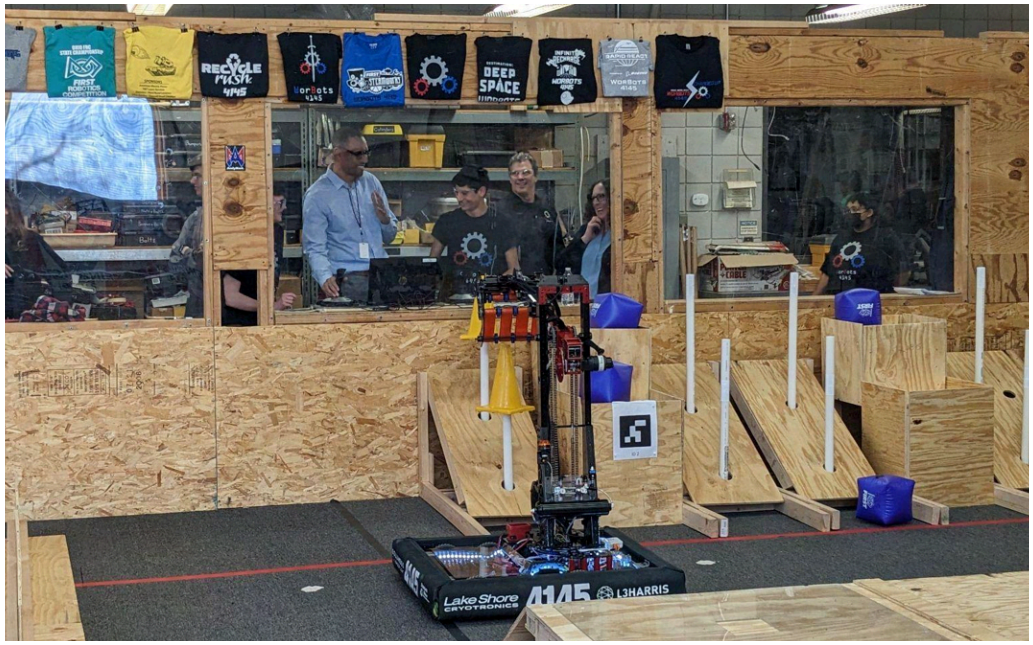

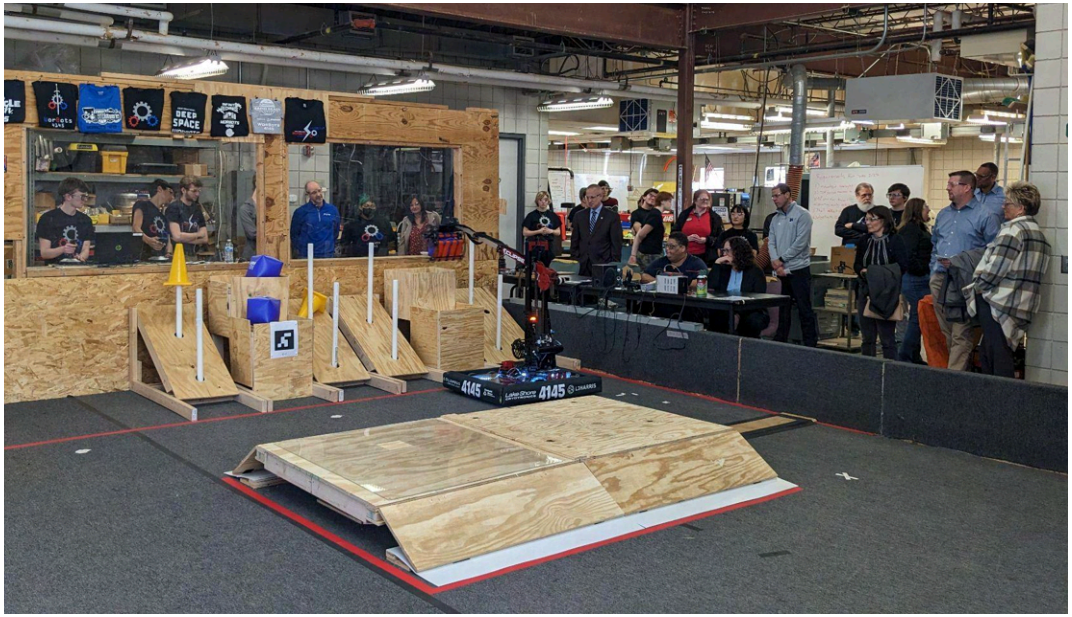

Team Name: WorBots

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Team Number: 4145

ID-083

https://www.aepohiowire.com/aep-helps-robotics-teams-rise/

The WorBots at Work

The robotics team at Worthington Kilbourne High School and Thomas Worthington (aka the "WorBots") is just one of those 28 Ohio teams. For the 30+ members of the group, it's not all fun and games – it's serious business, too. The program is year-round; however, their laser-like focus intensifies the moment the annual theme is announced the first Saturday in January. This year it's having the robot pick up traffic cones and cubes and getting the mechanisms in place to charge an electrical grid; last year it was shooting baskets and climbing monkey bars.

The robotics program is year-round; however, the team's laser-like focus intensifies the moment the annual theme is announced the first Saturday in January.

The next two months are a frenzy of activity preparing for the big event. Though one part of the competition is fought on the field, another is hotly contested in the realm of communications. Each team includes a marketing group, and another trophy – the prestigious Impact Award – goes to the team who best made a mark on their community and spread the importance of STEM programs in schools. There are additional awards for sustainability, entrepreneurship, creativity, team spirit and more. And the team is passionate about community outreach, offering demonstrations at elementary schools and local events and organizing charity drives.

Braylee Hsu, a 16-year-old senior at Thomas Worthington, is the president of business operations for the WorBots. She says the team's motto is "Engage, Inspire, Impact." (Watch the reveal of their 2023 robot, "Eclipse.")

"Yes, we're good at robots. But another part of our excellence is how our students are contributing to the local community," she said.

There's another method to the madness: The tasks the robots complete are not dissimilar from those performed at industrial factories, warehouses and other businesses. There's a real-world application that's beneficial for both the students and the companies that are involved.

The WorBots robot in 2023 is named "Eclipse" because the claw it uses to pick up objects looks like an e-clip.

"There's a big emphasis on engineering. Many of the lessons you can learn in the classroom, but by directly working on the challenges you can pick up a lot more by doing," Hsu said. "The competition also helps students build leadership skills you might not otherwise see. It's highly attractive to employers and the opportunity is full of potential for the students, too."

AEP is happy to support local robotics programs and Hsu said the feeling is mutual.

"We're very grateful and honored. AEP has been a consistent sponsor and that support is very impactful to sustain what we do," she said. "It also allows us to connect with a part of our local community that you don't normally see firsthand. It brings us all together."

Watch the Action!

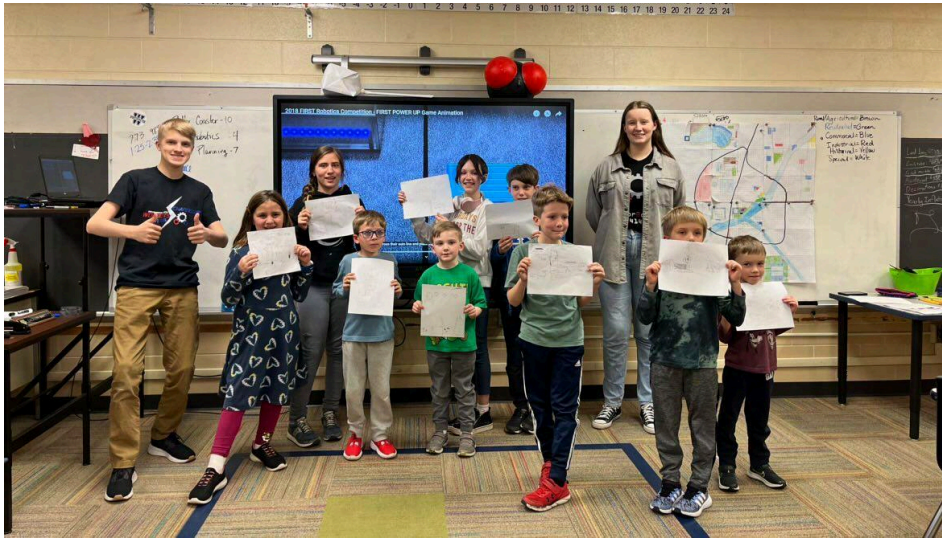
Thomas Worthington's robotics team has been in existence since 2012 – that's more than a decade of fundraising raffles, candy sales and small business solicitations – and the school found particular success in 2018 and 2019 when they won the Buckeye Regional. The WorBots participated in the Miami Valley Regional March 15-18 and are eying several more in the coming weeks:

- **Buckeye Regional** (Cleveland): March 29-April 1
- **Greater Pittsburgh Regional:** April 5-8

Team Name: WorBots

Team Number: 4145

ID-084



Team Name: WorBots

Team Number: 4145

ID-085

WorBots 4145: Rookie Training

Cultivating a Culture of STEM in Worthington, Ohio

Program Overview

Each season, we guide prospective rookie team members through designing, building, and programming a robot in approximately six weeks with guidance from our returning students and mentors. For our business team, new members create formal presentations and learn formal writing, presenting, phone calls, and emails. All new members learn about team history and our mission, building a cohesive program.

By having returning and new team members work together while rookies move throughout the aspects of our training, rookies **develop relationships with one another.**

By working through a technical challenge in a short span, new technical members **develop fundamental STEM knowledge and confidence**, which they carry into the build season.

Through working with one another throughout the duration of rookie training, our program **fosters a sense of teamwork** between new and returning WorBots.

Training Timeline

Week 1 – All new students are introduced to the principles and history of the team. Technical students are introduced to the challenge, while business students work on a more in-depth version of the team overview and begin a presentation assignment.

Week 2 – Students get to know their subteam leads and returning members as they progress throughout the challenge given. Technical team members finalize the design process at this point and move onto prototyping. Business students work on presentations.

Week 3 – Technical students finish prototyping and move onto either fabrication or programming. Business students finish their presentations and get structural feedback. All students are expected to have joined the Discord server.

Week 4 – Technical students carry on with work in their respective subgroup. Subteams should be one-third of the way done. Business rookies begin presenting their presentations to returning members and getting feedback from the business team.

Week 5 – Fabrication students finish building the rookie bot to pass it on to the programming students. Programming students finalize the code they were able to work on before getting the robot. Business students run their final presentation and work on mock sponsorship calls.

Week 6 – Programming students finish working on the rookie bot and we run a "robot reveal" for the rookie robot. Business students participate in a sustainability presentation. All rookies should apply for the team on the *FIRST* website at this time.

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Team Number: 4145

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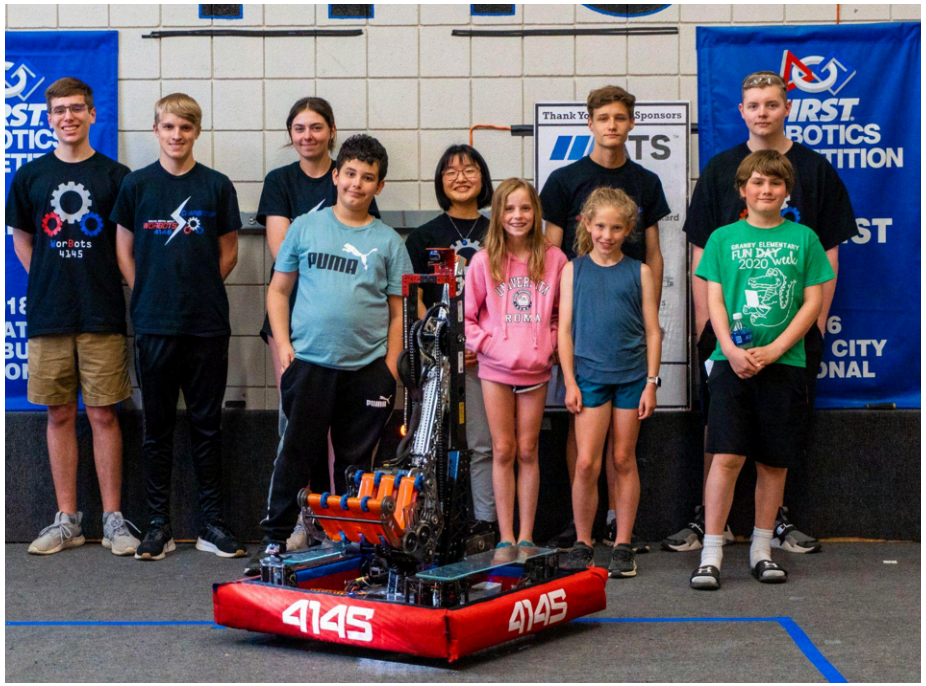

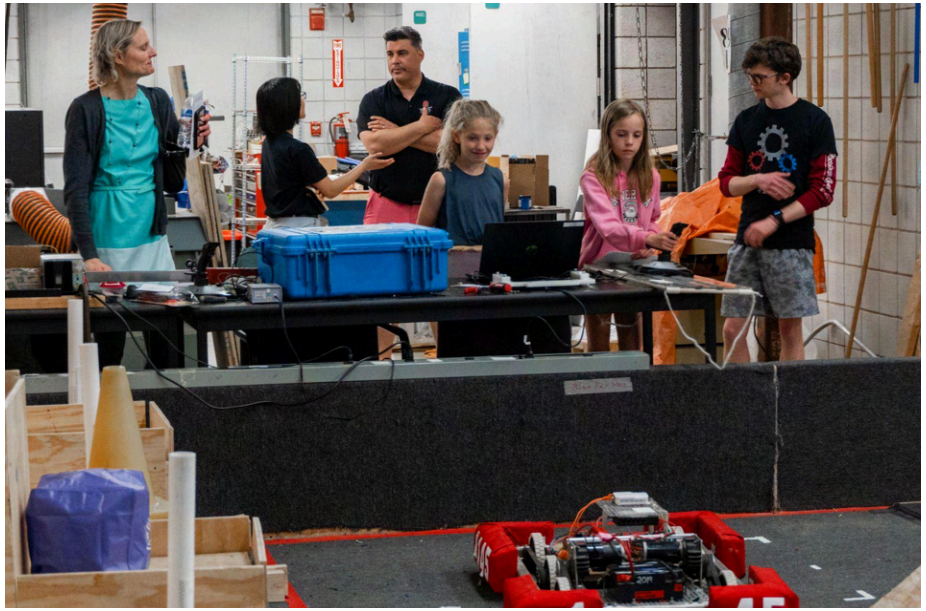

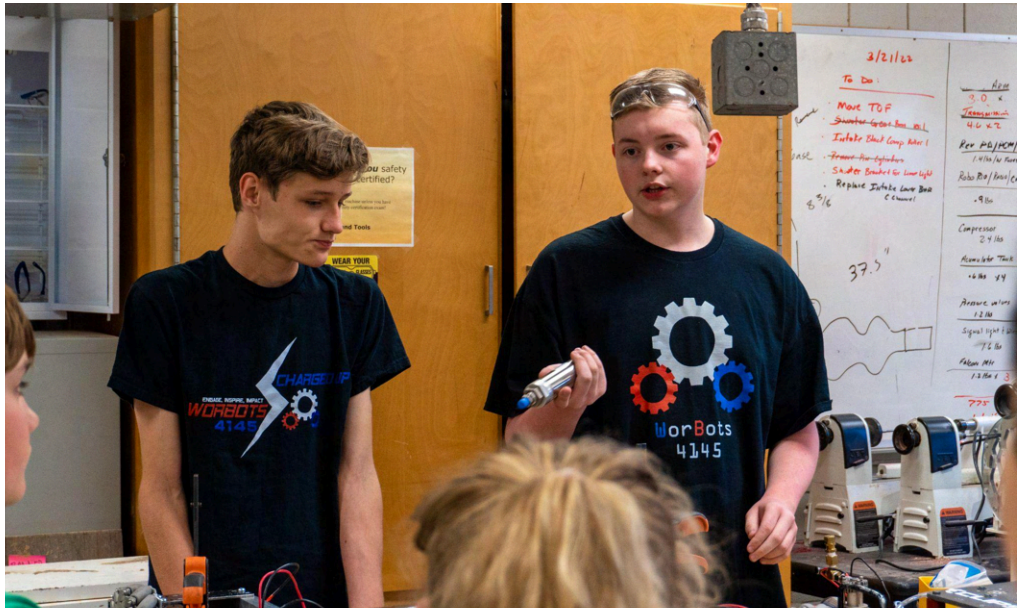

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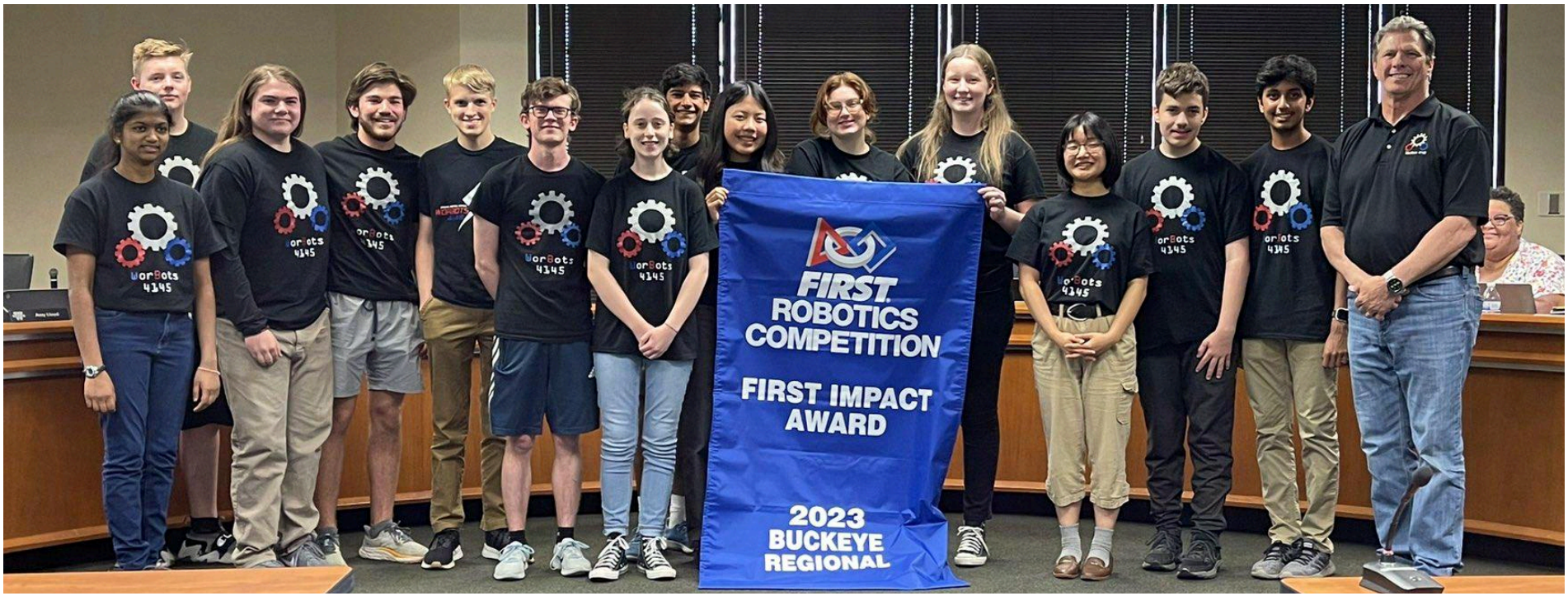

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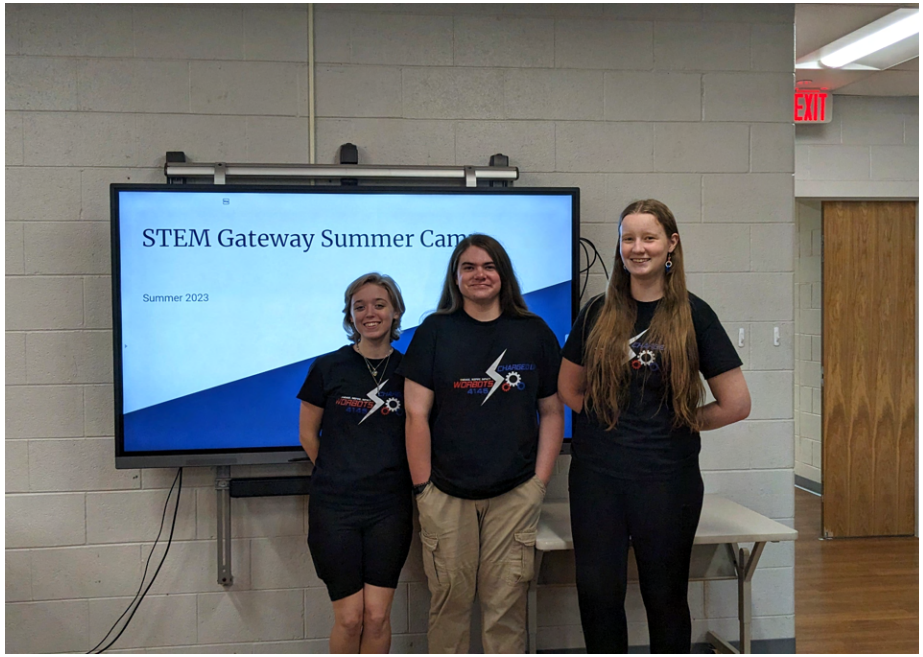

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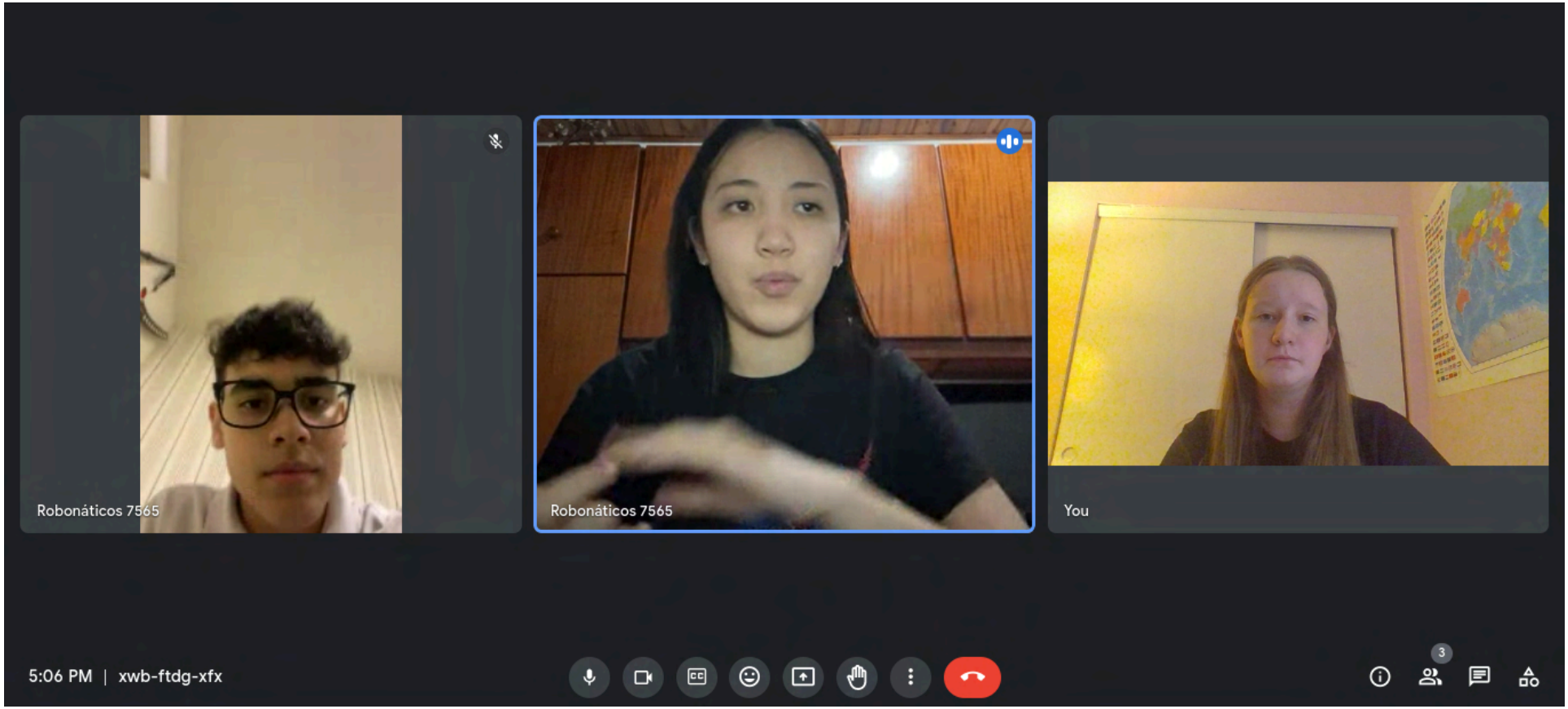

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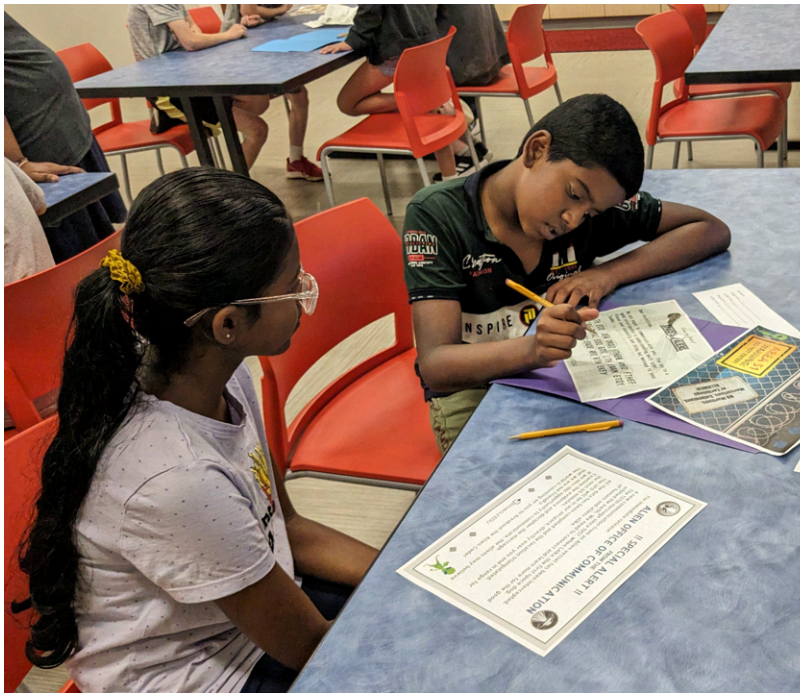

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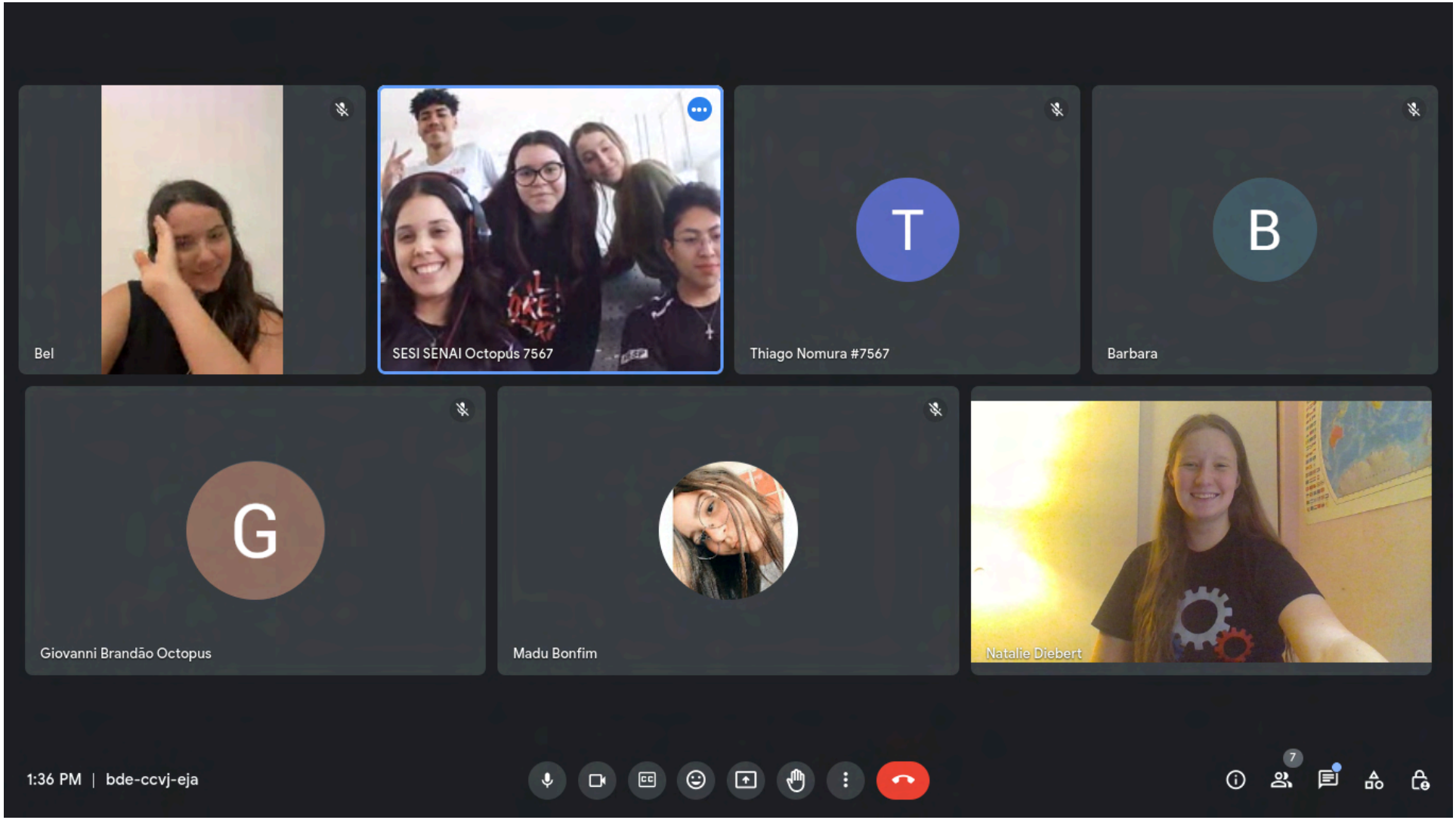

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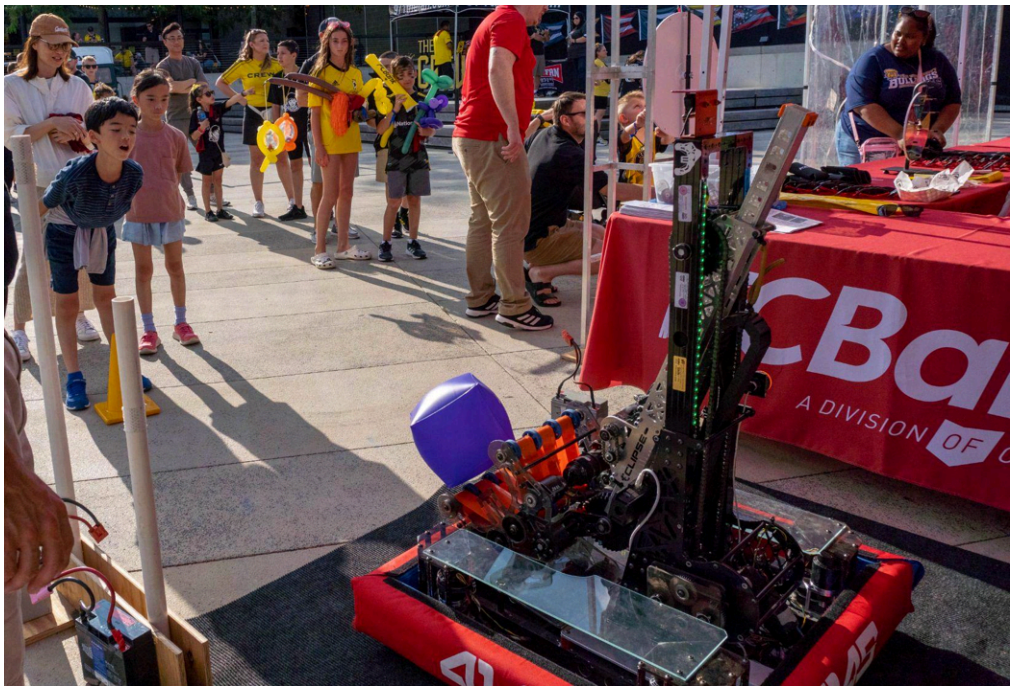

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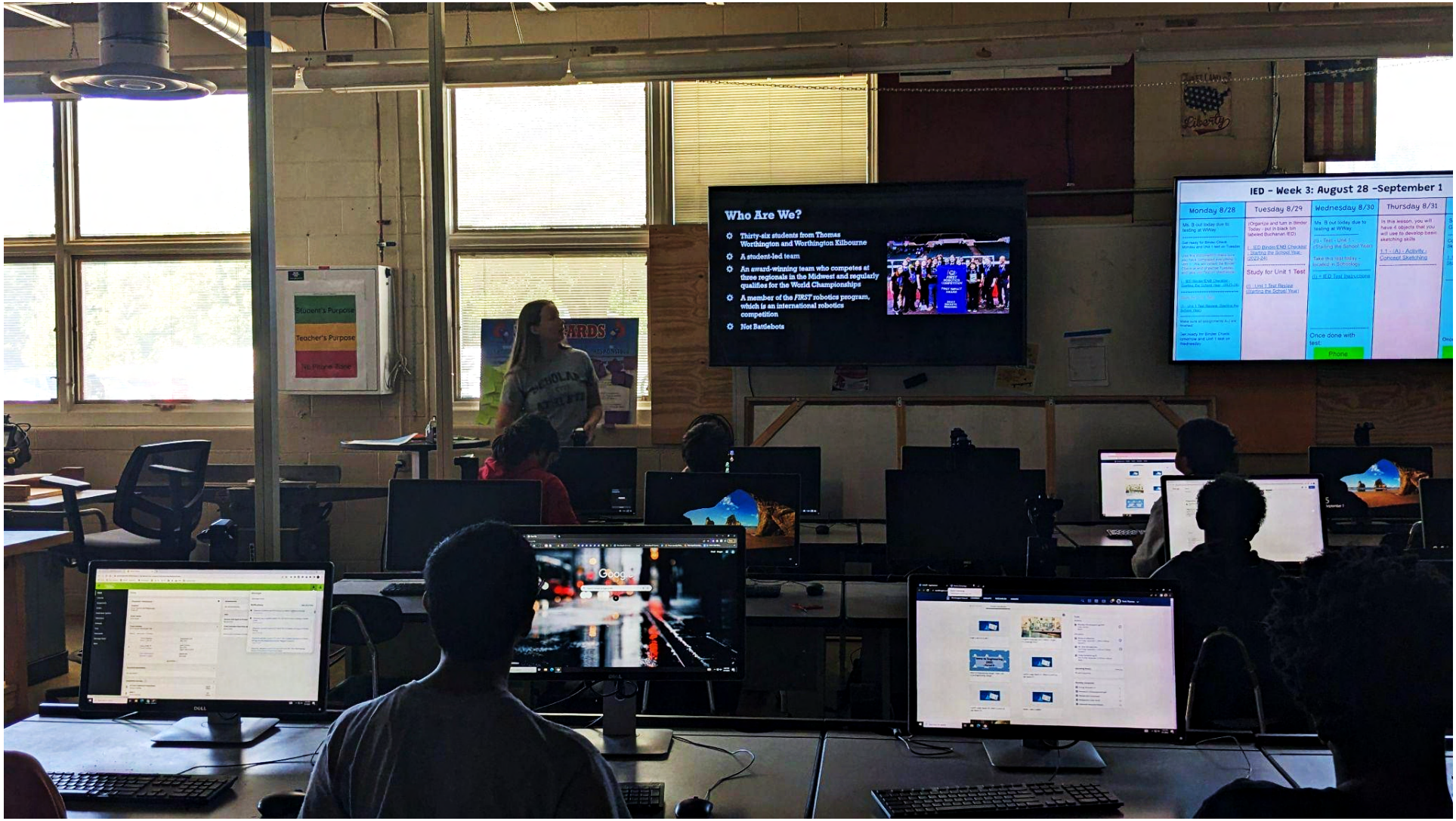

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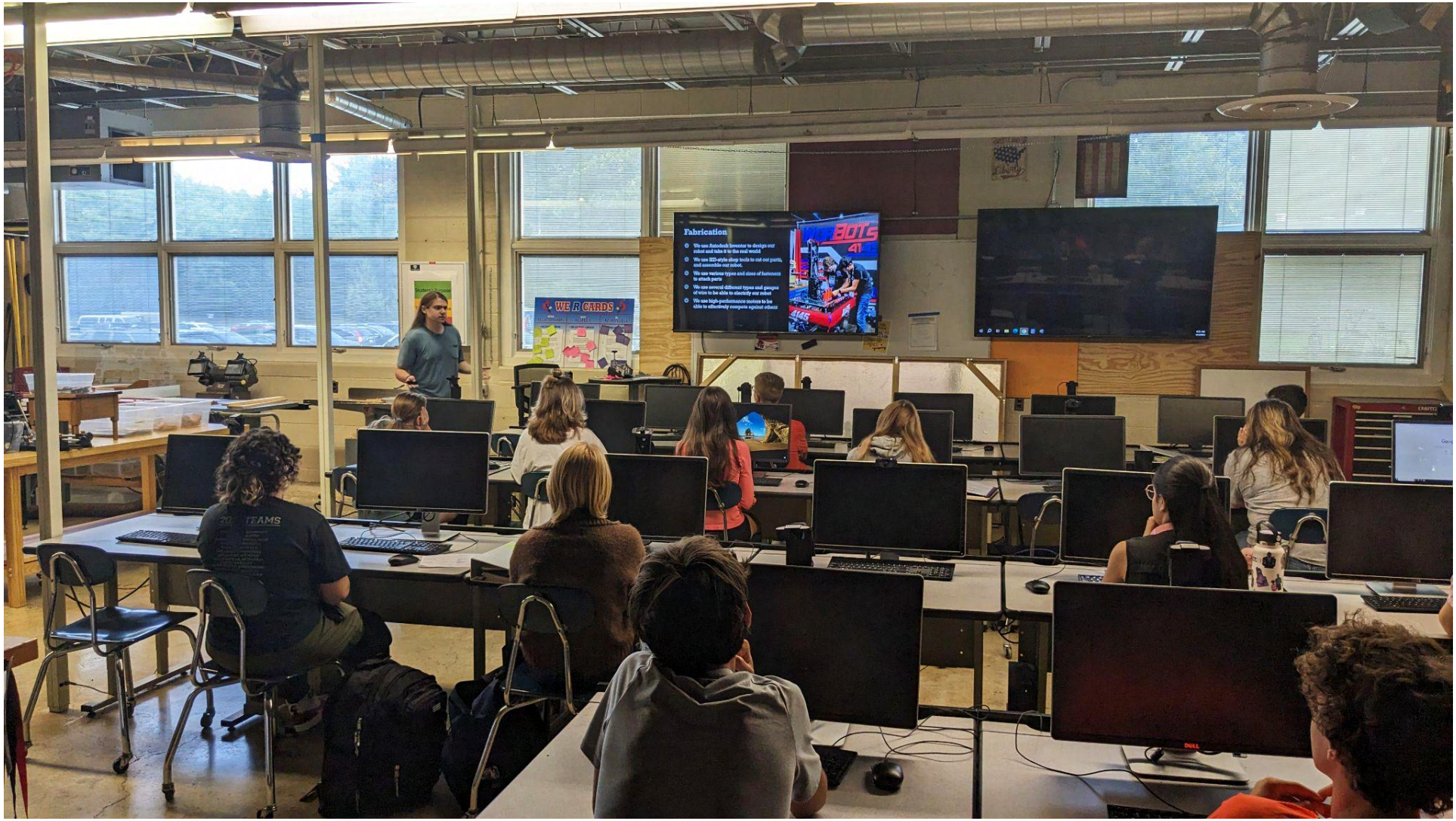

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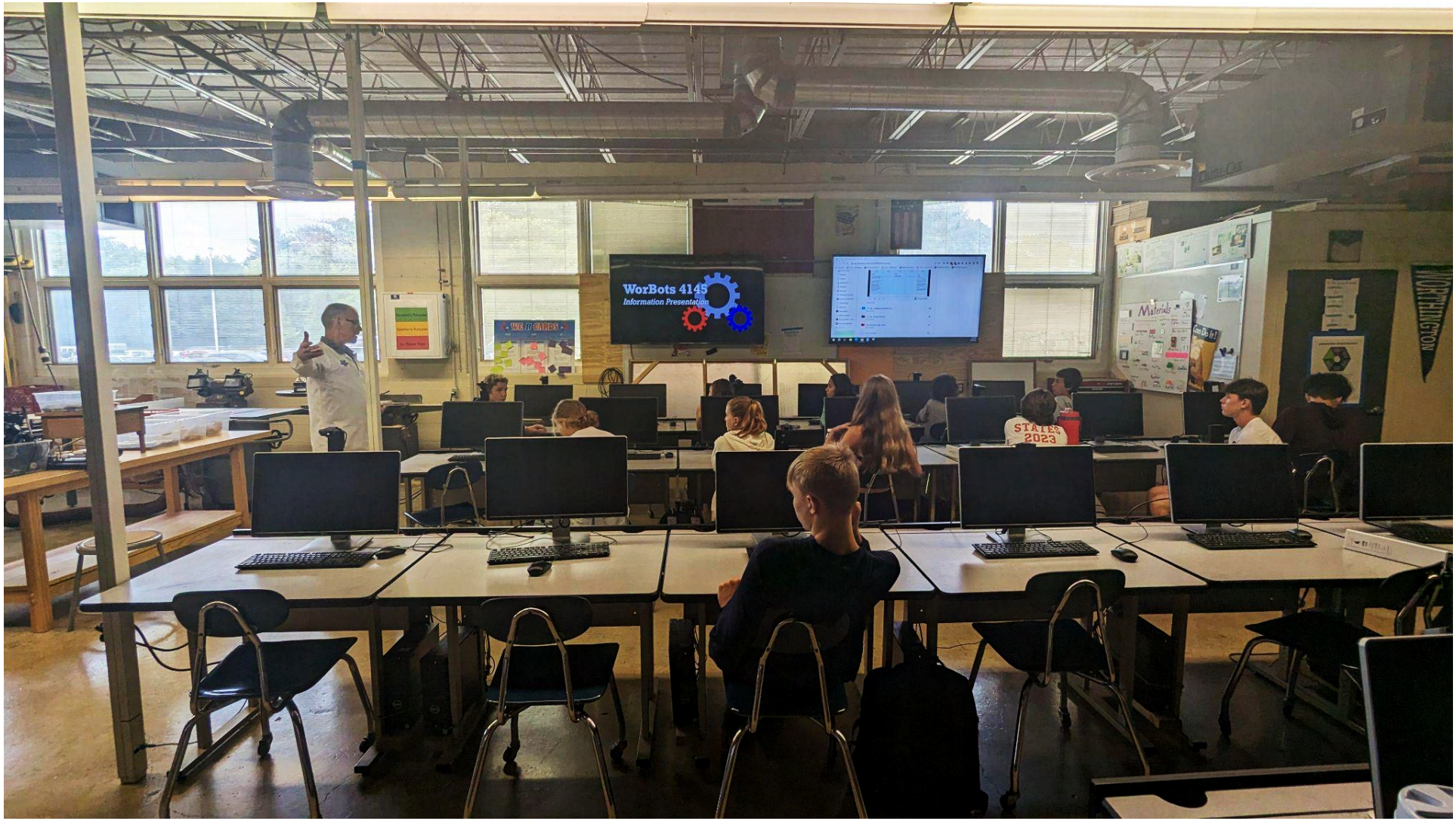

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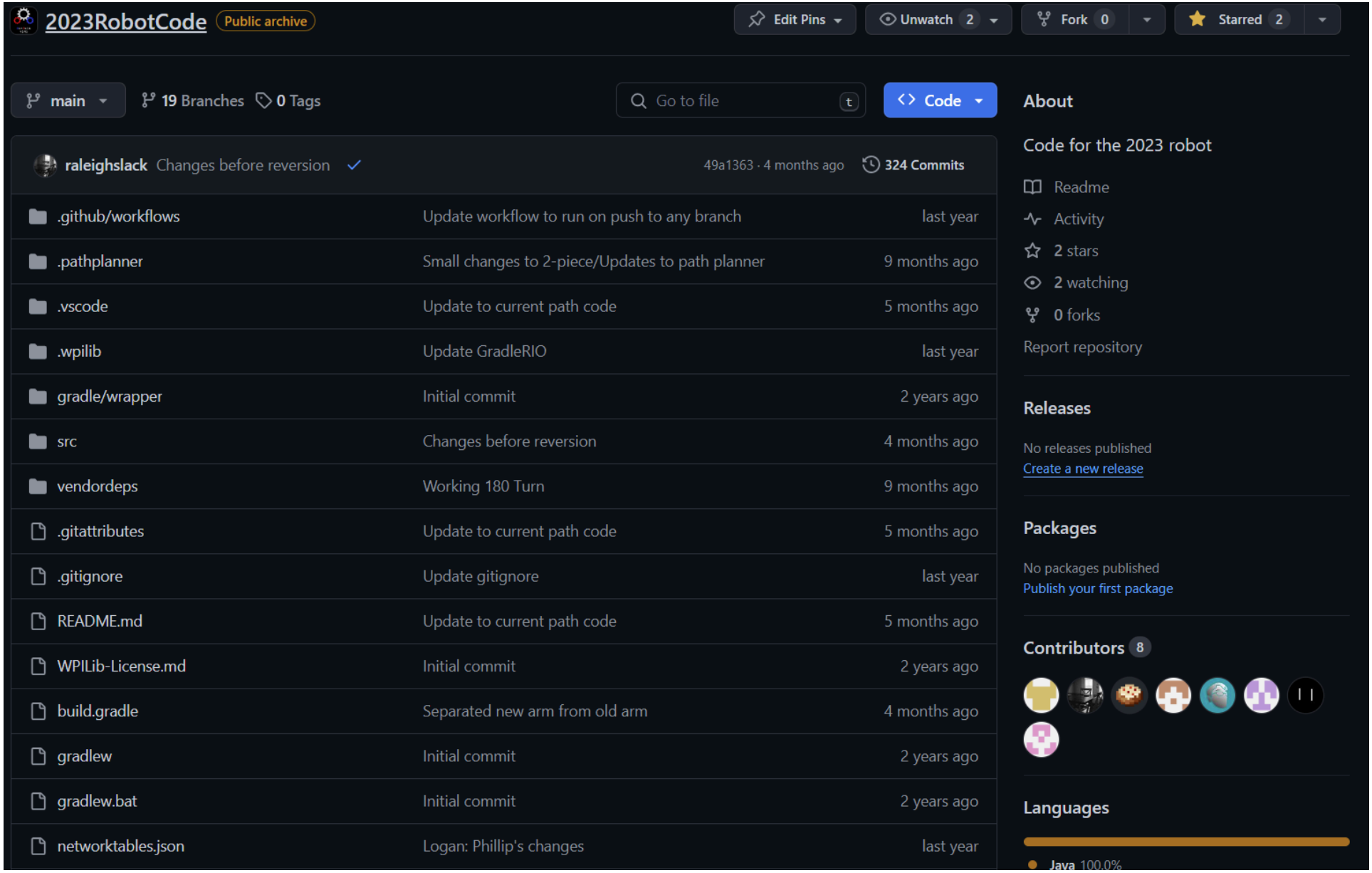

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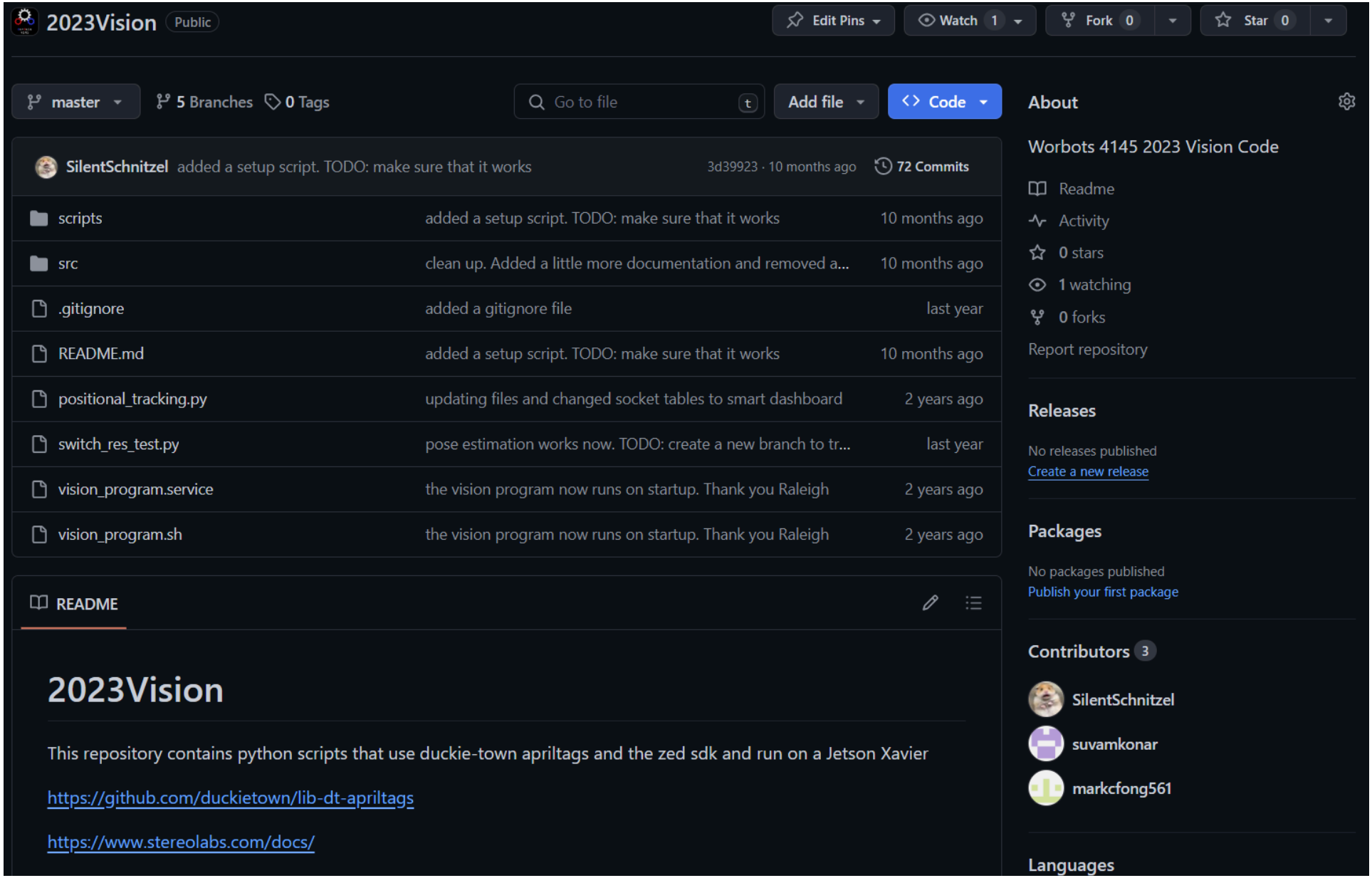

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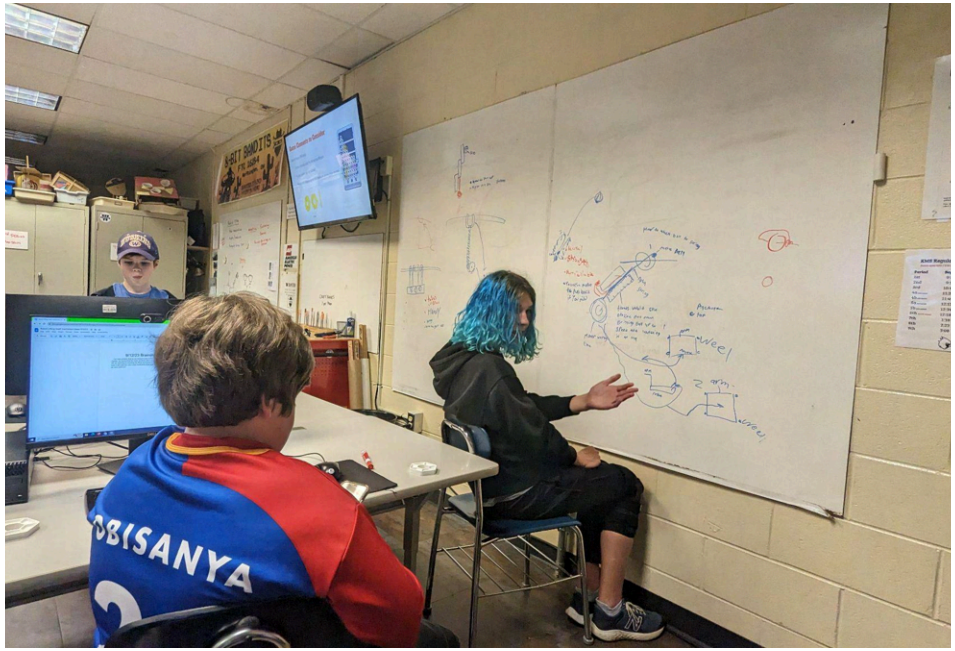

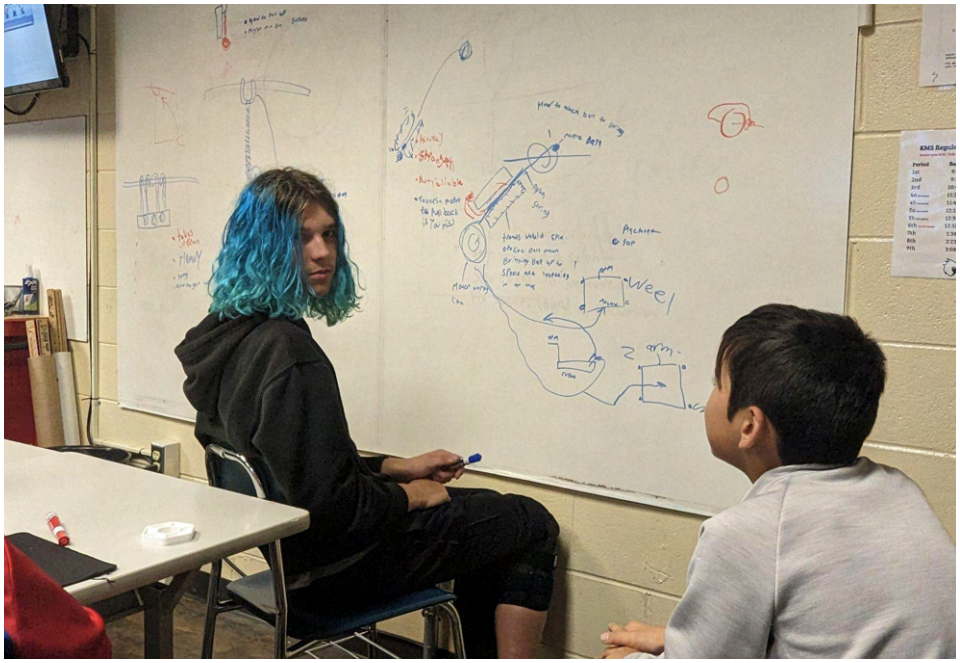

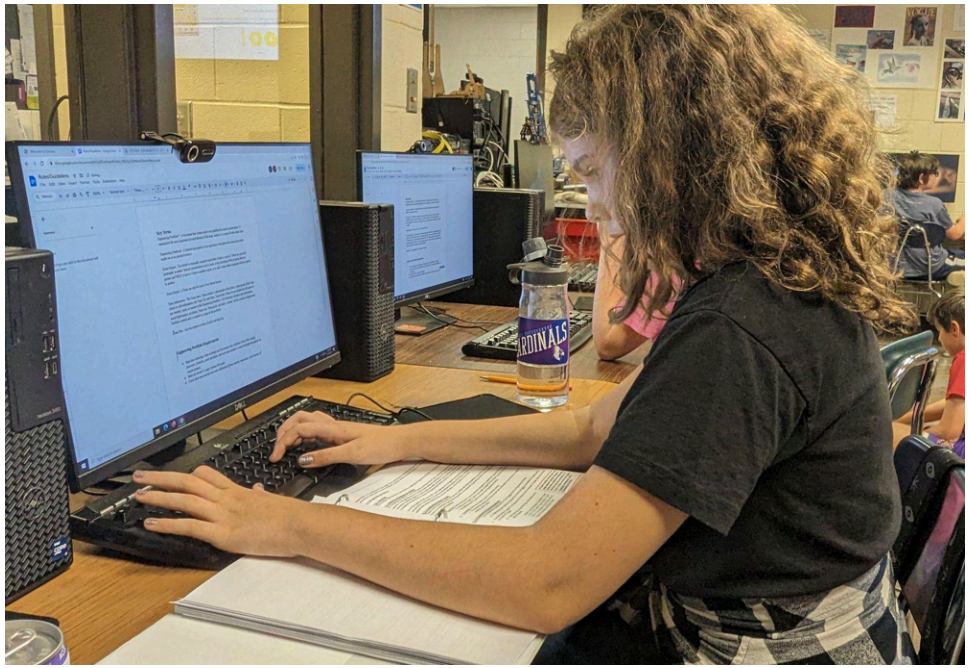

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Team Number: 4145

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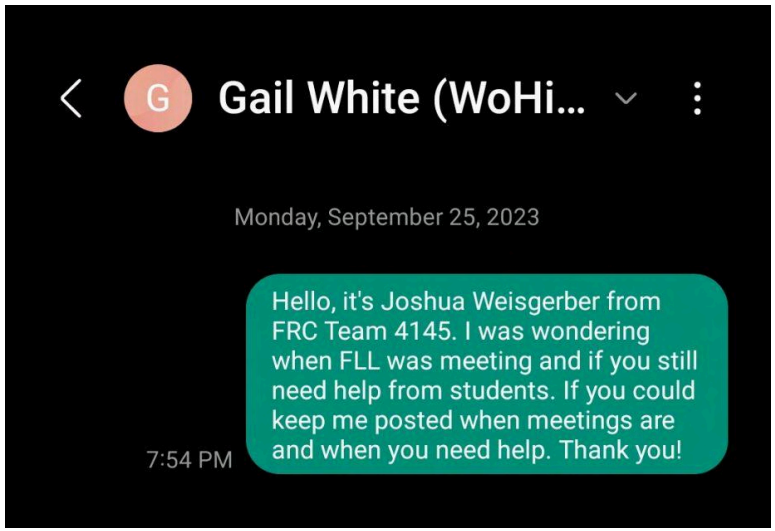

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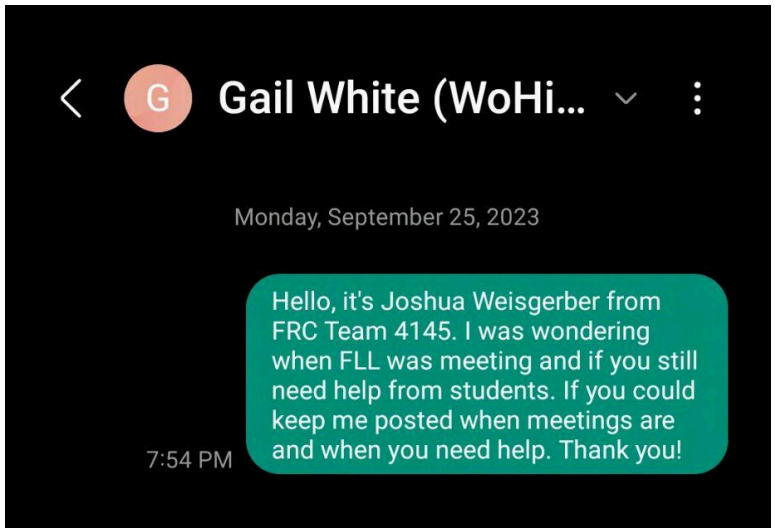

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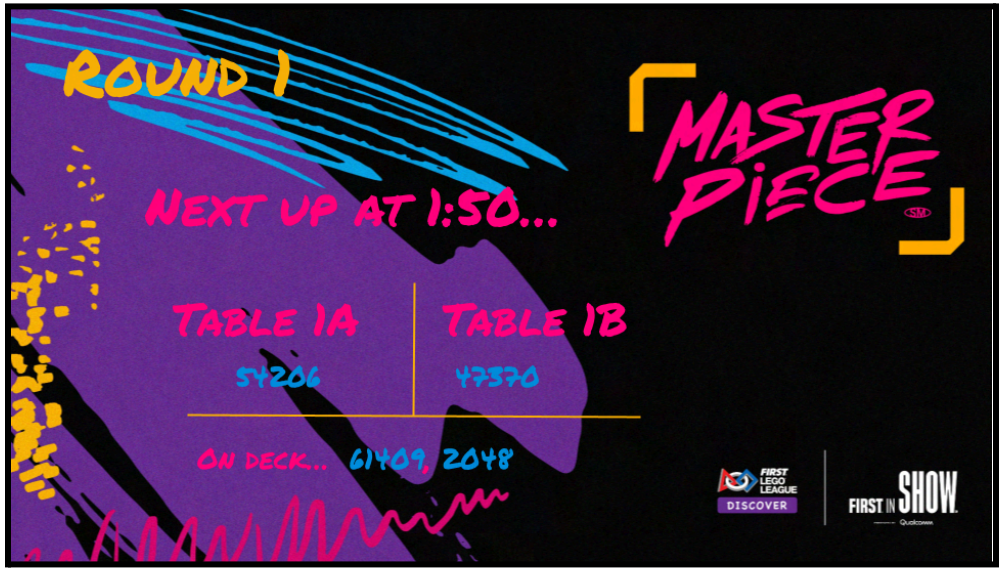

Team Name: WorBots

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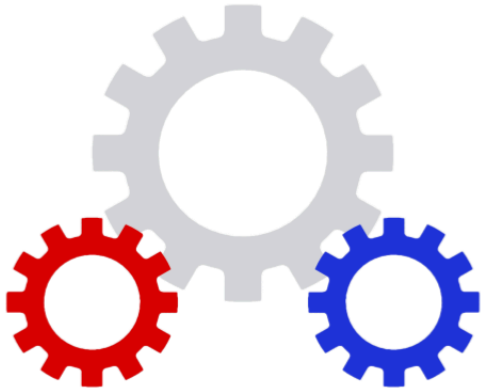
The WorBots 4145

2023 - 2024 Business Plan



Cultivating a Culture of STEM in Worthington, Ohio

ENGAGE, INSPIRE, IMPACT

Team Name: WorBots

Team Number: 4145

ID-129

WorBots 4145
Cultivating a Culture of STEM in Worthington, Ohio

Recruiting Information Sheet

Key Strategies:

- **Contact the Administration!** By working with the administration of the schools your team comes from, you can get on the announcements, participate in school events, and get free advertising at other events as well. Having the administration on your side benefits all other recruiting methods!
- **Reach outside STEM!** An FRC Team is not only for students that are already participating in STEM programs, and there are a multitude of awards for fields in art, business, and graphic design. Reach out to the business and arts programs at your school, and your team will have a wider skill set to pull from.
- **Contact Teachers!** Teachers can be the link between your team and the general school population, or even help as mentors for your team! Taking the time to have a conversation could boost your team for years to come.
- **Make Posters!** How are students going to know your team if they aren't reminded? Make some fun designs and summaries that they will walk by each day, and watch the students roll on in. Having some name awareness around your school is key to having a successful team.
- **Meet With Younger Grades!** Our team has had a lot of success with bringing our robot to STEM days in our nearby middle and elementary schools, and doing simple demonstrations. While it does not immediately benefit your numbers, interested students will soon move up to join!
- **Set Up Feeder Teams!** While it takes a lot of effort, having a more solid pathway of robotics K-12 can really boost your team to another level! Not only will more people come into your team, they will also already have some basic skills and knowledge about robotics.
- **Get a Social Media Presence!** Make sure your team has some basic accounts set up on the major platforms, so that you can share competition and workshop photos! If you do it well, you can not only get student recognition, but also parental knowledge and support!

If you have any questions, you can reach us at:
Email: worbots4145@gmail.com
Instagram: @worbots4145
Twitter: @worbots4145

Team Name: WorBots

Team Number: 4145

ID-130

WorBots 4145
Cultivating a Culture of STEM in Worthington, Ohio

Recruiting Information Sheet

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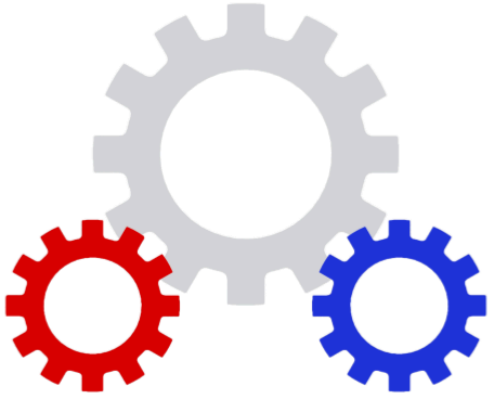
Team Name: WorBots

Team Number: 4145

ID-131

The WorBots 4145

2024 Branding Standards



Cultivating a Culture of STEM in Worthington, Ohio

ENGAGE, INSPIRE, IMPACT

Team Name: WorBots

Team Number: 4145

ID-132

WorBots 4145
Cultivating a Culture of STEM in Worthington, Ohio

Student: Kylie
Grade Level: 11
Season: 2023 - Charged Up

Explain how the student embodies the philosophies of Gracious Professionalism and Coopertition through the *FIRST* Core Values: Discovery, Innovation, Impact, Inclusion, Teamwork, and Fun. Please provide examples.
In and beyond our team, Kylie is known for her energy and enthusiasm. As one of the key contributors to the creation of a spirit team, she involved everyone in the excitement of competition and was known by other teams for her help in developing cheers during elimination matches. As she focused on the spirit effort, she did much more than just cheer — she created signs and set up our team numbers, ensuring every member had a role in cheering on our team. Within team practices, she works extensively with new students — fostering confidence and ensuring that everyone who's interested can build a robot. Before students even join the team, she focuses on connecting our schools with STEM by driving at outreach events, capturing the attention of attendees.

How has the student increased the awareness of *FIRST*? Describe the student's interests and/or plans to continue to engage with *FIRST* beyond high school. Please provide examples.
Since joining the WorBots, Kylie has worked alongside the team to improve presence within one of our schools. At four consecutive outreach events in ten days, she drove a robot and helped answer questions from over fifty students. As a member of our team, she participated in numerous events throughout the 2022 off-season, answering questions and fulfilling any role she could. When we were recruiting new students, she helped us connect with PLTW students, further building our presence in one of our schools. While she is still mapping out her future, she believes that *FIRST* will remain an integral part of her life as it has had a positive impact on her.

Describe the student's technical expertise, using specific examples in the areas of programming, electronics, design, fabrication, making, illustrating how these skills have contributed to the team's success. Please provide examples.
During her first year on the team, Kylie excelled within our training program — bringing technical knowledge developed through FLL and PLTW courses to her group. She worked on the development of the off-season robot, and strengthened her skills and precision as she was certified on tools. Her work with the 2022 off-season climber elevated our robot and its ability to score during matches, leading to it compete in elimination matches at our first off-season event — Curiosity. This year, she is a key member of our fabrication team — working primarily with the chassis. Kylie is continuing through the Project Lead the Way (PLTW) track this year as well as next, focusing on skill-development to apply to the WorBots.

How does the student's individual contribution to the team benefit the team as a whole in the areas of fundraising, outreach, entrepreneurship, and creativity? Please provide examples.
Kylie frequently works with outreach events such as shop tours, demonstrations, and science days. Last season, she provided a unique perspective as a newer member of the team — showing attending students the opportunities available even within one's first year on the team. At Thomas Worthington (TWHS), the school we partner with, she drives our demonstration robot — captivating the attention of attendees. She has also strengthened our relationship with the PLTW program at TWHS as she is well-known for her dedication to those classes, allowing us to sustain member retention from the school. At competitions, Kylie is known to be one of the most enthusiastic members of our team in the stands — creating cheers and dancing, energizing those around her to do the same.

Team Name: WorBots

Team Number: 4145

ID-133

WorBots 4145
Cultivating a Culture of STEM in Worthington, Ohio

Student: Natalie
Grade Level: 10
Season: 2023 - Charged Up

Explain how the student embodies the philosophies of Gracious Professionalism and Coopertition through the *FIRST* Core Values: Discovery, Innovation, Impact, Inclusion, Teamwork and Fun. Please provide examples.
Natalie is an active leader within our team and the *FIRST* community. In her first year on FRC, she grew our team from a business perspective and continues to trailblaze into her second year. She initiated an innovative strategic marketing plan and expanded the team data collection and documentation system, leading her teammates on how to apply this information. Through social media, Natalie steps up to assist other teams; whether it be answering questions, giving advice, or reviewing materials, she connects with *FIRST* community members internationally. She engaged with a team from Turkey, advising them on how to run and host outreach and off-season events as well as acquire sponsors. Additionally, she assisted a student in Germany on how to set up an FRC team.

How has the student increased the awareness of *FIRST*? Describe the student's interests and/or plans to continue to engage with *FIRST* beyond high school. Please provide examples.
Coming from the FTC program, Natalie is passionate about expanding our feeder pathway and the impact of *FIRST*. She continues to mentor her previous team, ensuring students have access to STEM. She reached out to teachers across our district to discuss how to start an FLL team. At shop tours and through email, she engaged with parents and students alike to cultivate interest for FLL and FTC teams. At other community events, she speaks with attendees about *FIRST*. After finding out our schools are getting remodeled, Natalie advocated for our team at a board meeting, ensuring that *FIRST* is sustained throughout Worthington. Upon graduating high school, Natalie plans to continue to mentor *FIRST* teams near the university she attends, volunteer at *FIRST* events, and judge for competitions.

Describe the student's technical expertise, using specific examples in the areas of programming, electronics, design, fabrication, making, illustrating how these skills have contributed to the team's success. Please provide examples.
Natalie's technical expertise spans from scouting to data collection and analysis. One of our team's alumni who now volunteers at *FIRST* events guided her through the process of scouting, such as how to analyze robot capabilities and strategies. Through her active participation, Natalie has now become our team's scouting lead, scouting over 90 teams, and coordinating all of our members at competitions to deliver accurate and timely information to our drive team. She also advanced our team's data collection system, consolidating participant and alumni information, and developing team statistics. She uses data collected about events attended from team members, reach stats, and other measurable results to determine the effectiveness of events and modify them accordingly to improve events.

How does the student's individual contribution to the team benefit the team as a whole in the areas of fundraising, outreach, entrepreneurship, and creativity? Please provide examples.
Natalie brings outstanding energy to our team. With her passion for the *FIRST* program, she increased our team's presence with the Impact Award, involving the entire team throughout the process. She plans outreach events, such as STEM presentations for elementary school students, and connects with administrators throughout our district to start feeder teams, increasing our team's sustainability. Additionally, she helped run a booth with FC Bank at Worthington Market Day, an event with 100,000 attendees, to promote our team, recruiting a new mentor. Additionally, after seeing DHL's CLO speak about how they use robots within their facilities, she reached out to him, following up with a cold call to establish a partnership with them.

Team Name: WorBots

Team Number: 4145

ID-134

WorBots 4145
Cultivating a Culture of STEM in Worthington, Ohio

Mr. Karns 2023 Woodie Flowers Award Essay

Since founding the WorBots, Team 4145 in 2012, Mr. Karns has put the "sport" in "sport for the mind." Prior to starting the team, Mr. Karns served as a football coach for 33 years; now, he is driving home STEM education from the classroom to the end zone by means of *FIRST*. When he started the WorBots, Mr. Karns was a PLTW teacher at Worthington Kilbourne High School. Mr. Karns wanted to give his ~20 interested students an opportunity to apply what they learned outside of the classroom. Today, while retired from teaching Mr. Karns remains engaged as our lead mentor, spending over 35 hours each week during the build season to ensure students have educational opportunities through *FIRST*.

During the preseason, Mr. Karns encourages leads to pass the ball to new members through our rookie program. He collaborates with our mentors and subteam leads to guide rookies through a crash course on building rookie robots; allowing the students to expand their STEM knowledge and prepare them for the season. This training doesn't stop with technical skills. Mr. Karns teaches prospective WorBots about the Core Values of *FIRST* — describing the importance of Gracious Professionalism through his now famous stories.

At our kickoff event, Mr. Karns has us break into design subteams to develop potential ideas for the robot. From there, he encourages students — whether it's your first or fourth season — to present their ideas including tradeoffs. He is not afraid to pull out the whiteboard to outline strategy or to compare differences in designs. This approach acclimates our new members, while helping them to develop communication skills and confidence that can be applied to the real world. Once a strong design is selected, he guides our fabrication team through the build of our robot. He encourages the team to leverage a modular design to build the robot in an agile fashion. He emphasizes time management so that the robot can be passed to the programming team in a timely manner. Concurrently, he supports our fabrication rookies as they build an off-season robot — ensuring that no students are left on the bench. Rather than giving students answers, he asks questions and pushes them to think through their own approaches — causing consistent team growth.

For Mr. Karns, it is much more than just one team or robot. Within the *FIRST* community, he is never afraid to share our playbook, programming team, or spare parts to help other teams succeed. He is active among Central Ohio mentors and teams, including his involvement with the CORI Invitational, which we seasonally host at our school. For students, Mr. Karns serves as a role model, with many citing him as an inspiration for pursuing careers in science and technology. He frequently talks to the team about their academic aspirations after high school and writes recommendation letters for team members. Mr. Karns doesn't fumble the opportunity to inspire us and create a lasting impact on both the Worthington and *FIRST* communities.

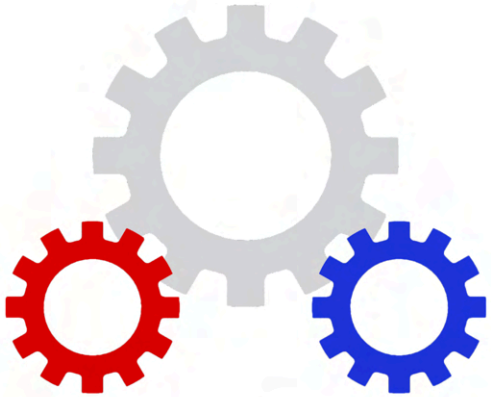
Team Name: WorBots

Team Number: 4145

ID-135

The WorBots 4145

2022-2023 Impact Award Binder



Cultivating a Culture of STEM in Worthington, Ohio

ENGAGE, INSPIRE, IMPACT

Team Name: WorBots

Team Number: 4145

ID-136

Describe the impact of the *FIRST* program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in *FIRST* programs as mentors/sponsors.
In the last three years, 100% of our alumni graduated high school (92% is the district average), 100% went to college (83% is the district average), 92% pursued STEM in college (compared to the estimated 32% of Worthington alums), 2 volunteered at 2022 off-season events, and 4 returned to mentor this season. Our team members have an average 3.89 unweighted GPA (3.07 is the district average), and 69% of students are in PLTW courses. 89% of members cite *FIRST* as a reason they want to pursue STEM.

Describe your community along with how your team addresses its unique opportunities and circumstances. Worthington Schools includes 11 elementary, 5 middle, and 2 high schools. Before our team, high school courses made up most of the STEM education opportunities. To catalyze STEM growth, we started 4 *FIRST* teams in the last 5 years, promoted STEM at community events, educated students about robotics, and advocated for STEM in our district. Recently, after finding out our high schools were remodeling, we advocated for STEM/PLTW spaces at both schools—expanding STEM access for years to come.

Describe the team's methods, with emphasis on the past 3 years, for spreading the *FIRST* message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?
Through hosting the CORI Invitational with the PAST Foundation (2018, 2019, and 2022), hundreds of community members, district officials, and FLL/FTC students see the impact of *FIRST* as 30 teams from the Midwest compete. By mentoring young students in feeder programs and creating training programs, we ensure that everyone can build a robot. 39% of our team comes from a feeder team (compared to 25% in 2021), and 78% of our team attended an outreach event before joining (compared to 55% in 2021).

Please provide specific examples of how your team members act as role models within the *FIRST* community with emphasis on the past 3 years.
Published resources (safety seminars, posters, checklists, and kits; sponsor information sheets; and recruiting guides) and shared awards submissions at competitions have assisted 300 teams. We helped FRC 6916 get parts, cut parts, figure out design and strategy, and prepare for the season and now mentor the team. We assist teams at competitions with programming bugs, cheer teams on after presentations, and answer questions on social media. Mentoring FLL and FTC inspires future generations.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.
We started, financially assisted, and mentored 3 FLL and 1 FTC team. At one school, we started a robotics club in early 2022 to engage students; they are now on FLL 57154. We assisted FRC 6916 in getting parts pre-season and now mentor them. We answer team's questions on social media and through publishing resources. Recently, we helped FRC 8856 from Turkey learn more about outreach, talked to a STEM initiative in India about *FIRST*, and helped a student in Germany prepare to start a team.

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?
We demonstrate at after-school programs, curriculum nights, STEM camps, PLTW classes, orientation events, activities fairs, and community gatherings. We provide interactive activities at local library workshops, STEM fairs, science days, schools without formal programs, and in our shop for students from any Worthington school. These events introduced 78% of our current team members to *FIRST*, resulted in the creation of an FLL team, and encouraged students to join our FTC team when it started.

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years PATH Robotics provided a facility tour, and we have now acquired an electrical engineering mentor from there. Lake Shore Cryotronics and ATS Automation offered us engineering advice and internship opportunities. We have mentors who work for Honda and L3 Harris, two of our sponsors. PLTW teachers provide mentorship and assistance in reaching their students. FC Bank offered us space at Worthington Market Day. Impower.ai and Merrill Lynch reviewed our business plan and presentation.

WorBots 4145
Cultivating a Culture of STEM in Worthington, Ohio

WE ENGAGE
At the WKHS and TWHS activities fairs, curriculum nights, and orientation events, we demonstrate our robot and provide information to 800 incoming students annually, resulting in over 80 students expressing interest in becoming a WorBot this year. This summer, we demonstrated at the Olentangy Caverns geology camp to 68 kids ages 6-11. For middle school students, we ran a mini robotics competition where participants built sumo and maze robots. 33% of participants in this competition went on to join the WorBots, and this event led to increased student interest at Kilbourne Middle School—sparking the start of FTC 16284. In early 2022, we started an informal robotics club at Wilson Hill Elementary to inspire students to explore STEM; those students are now competing on FLL 57154!

To ensure STEM is accessible for all students, we offer scholarships to waive team fees for those who cannot afford them, and last season, we allocated new sponsorship funds to permanently reduce team fees by 60%—further promoting accessibility. We also contact both schools' SWE chapters to ensure that women interested in STEM know about the options available through *FIRST*. In 2019, we volunteered at an all-girls PLTW summer camp session (the pandemic disrupted this, but we are resuming this summer). For our off-season events, we had an all-girls drive team who served as inspirations for young girls in our feeder programs. We also worked with a group of 3rd grade Girl Scouts in 2023, connecting them with *FIRST* and teaching them about the engineering-design process by letting them drive our robot, complete a mock initial design meeting, and do hands-on STEM activities. In the past 3 seasons, we have gone from 18 to 43% female, including 70% of student leadership. Through these efforts, we are increasing diversity in STEM.

WE INSPIRE
After the season, we invite students and families from all grade levels in Worthington to tour our workshop and learn more about STEM and the *FIRST* program. We have seen the direct impact of these shop tours, as many students attending our 2018 middle school shop tour chose to progress to the FTC team started in their middle school the following year. In our Spring 2022 shop tour series, we ran stations where elementary and middle school students could drive the robot, learn about the engineering and design process, and hear more about how to get involved. This series of 3 shop tours engaged 100 families from all eleven Worthington elementary schools. 74% of the attendees requested more information about *FIRST*. In Winter 2022, we invited our FLL students into our shop to learn about FRC and see our robot in hopes of inspiring those students to remain involved with *FIRST*.

We introduced 30 students between the ages of five and ten to our program through a robot demonstration at an elementary after-school program in 2022. At science days and fairs, we bring our robot and information about our team to inspire hundreds of students and families to get involved. At a local library, during Summer 2022, we helped run a 2-hour workshop introducing 47 elementary-aged children to STEM by modifying various types of robots to compete in a mini battle bots-inspired competition. To inspire students to build upon their knowledge, we demonstrated our robot and presented it in PLTW classes.

In 2021, to inspire Worthington students to join 4145 regardless of prior STEM experience, we expanded our pre-season rookie training program, so students could work in groups of 5-10 to build robots alongside returning team members and mentors. This ensures that students find their passion within the WorBots, develop knowledge and confidence, and build necessary STEM skills. This season, we expanded this program to include crash courses in engineering concepts. 85% of students stayed with the team after training. Our team also builds 2 robots during the season—a competition and an off-season competition bot—ensuring all students have opportunities to work on a robot.

For every "traditional sport," there are cohesive pathways to encourage students of all ages to get involved; we are ensuring the same is available for robotics. We started four teams—FLL 44451, 44452, and 57154 as well as FTC 16284. Beyond starting teams, we sustain them by providing financial assistance and student mentors to our feeder programs. 39% of our current team members are from feeder teams compared to 25% of team members last year. Along with our *FIRST* pathway, relationships we developed during the 2021 season with ATS Automation and Lake Shore Cryotronics resulted in the team working with professionals who provided sponsorship, advice, and internship opportunities. Despite starting 11 years ago with little STEM presence in our community, Worthington students from kindergarten through college now have STEM opportunities.

Team Name: WorBots

Team Number: 4145

ID-137

Event Number	Activity	Classification	Exact Date	Competition Season	Applicable Definition	Documentation Type	Documentation Location	Purpose/Audience	Event Description	Direct Results	Goal Worked Toward
ACT-001	Examplar - STEAM Day	Outreach	January 1, 2023	Charged Up (2023)	Reached	Photo	[Google Drive Link]	To connect young kids from Smith Elementary School with STEM education, as there currently are not robotics teams there. All students are in an age range making them eligible for FLL, meaning they could join the resulting team.	We worked with a group of 65 students aged 9-11, helping them build small BrushBots by attatching motors to toothbrush heads. They then competed in a "sumo bots"-style competition.	65 Students Reached 12 Students Joined Local *FIRST* 1 FLL Team Started	Make STEM available in every elementary school throughout the school district.
ACT-002											
ACT-003											
ACT-004											
ACT-005											
ACT-006											
ACT-007											
ACT-008											
ACT-009											
ACT-010											
ACT-011											
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ACT-026											
ACT-027											
ACT-028											
ACT-029											
ACT-030											
ACT-031											

Sheet1

Team Name: WorBots

Team Number: 4145

ID-138

[Team Name]: Incident Report Form

Member Information

First Name: _____ Last Name: _____

Date: _____

Incident Description

_____

_____

_____

_____

_____

_____

Member Information

First Name: _____ Last Name: _____

Date: _____

Incident Description

_____

_____

_____

_____

_____

_____

Team Name: WorBots

Team Number: 4145

ID-139

Pit Safety Rules

- Goggles are *required* for everyone in the pit at all times
- Wear proper protective attire
  - Closed-toe shoes
  - No loose clothing
  - Tied back hair
- Do not run
- Stay alert at all times and be ready to react
- Robots have the right-of-way
- Keep all pit items within the pit
- Do not obstruct the aisles
- Power down all tools at the end of the day
- Clean up your tools before leaving

Team Name: WorBots

Team Number: 4145

ID-140

[Team Name]: Power Tool Approval

Member Information

First Name: _____ Grade Level: _____

Last Name: _____ Goggle Number: _____

Previous Safety Events

_____

_____

_____

_____

_____

_____

Approved Tools

❑	Drill Press	Approved By: _____
❑	Power Drill	Approved By: _____
❑	Metal Press	Approved By: _____
❑	Table Saw	Approved By: _____
❑	Horizontal Bandsaw	Approved By: _____
❑	Power Sander	Approved By: _____
❑	Miter Saw	Approved By: _____
❑	Band Saw (Wood)	Approved By: _____
❑	Band Saw (Metal)	Approved By: _____
❑	Hand Tools	Approved By: _____
❑	_____	Approved By: _____
❑	_____	Approved By: _____
❑	_____	Approved By: _____
❑	_____	Approved By: _____
❑	_____	Approved By: _____
❑	_____	Approved By: _____

Team Name: WorBots

Team Number: 4145

ID-141

[Team Name]: Shop Safety Procedures

Rule 1:_____

Description: _____

Enforcer (Lead/Mentor):_____

Consequence for Failure to Follow:_____

Rule 2:_____

Description: _____

Enforcer (Lead/Mentor):_____

Consequence for Failure to Follow:_____

Rule 3:_____

Description: _____

Enforcer (Lead/Mentor):_____

Consequence for Failure to Follow:_____

Rule 4:_____

Description: _____

Enforcer (Lead/Mentor):_____

Consequence for Failure to Follow:_____

Rule 5:_____

Description: _____

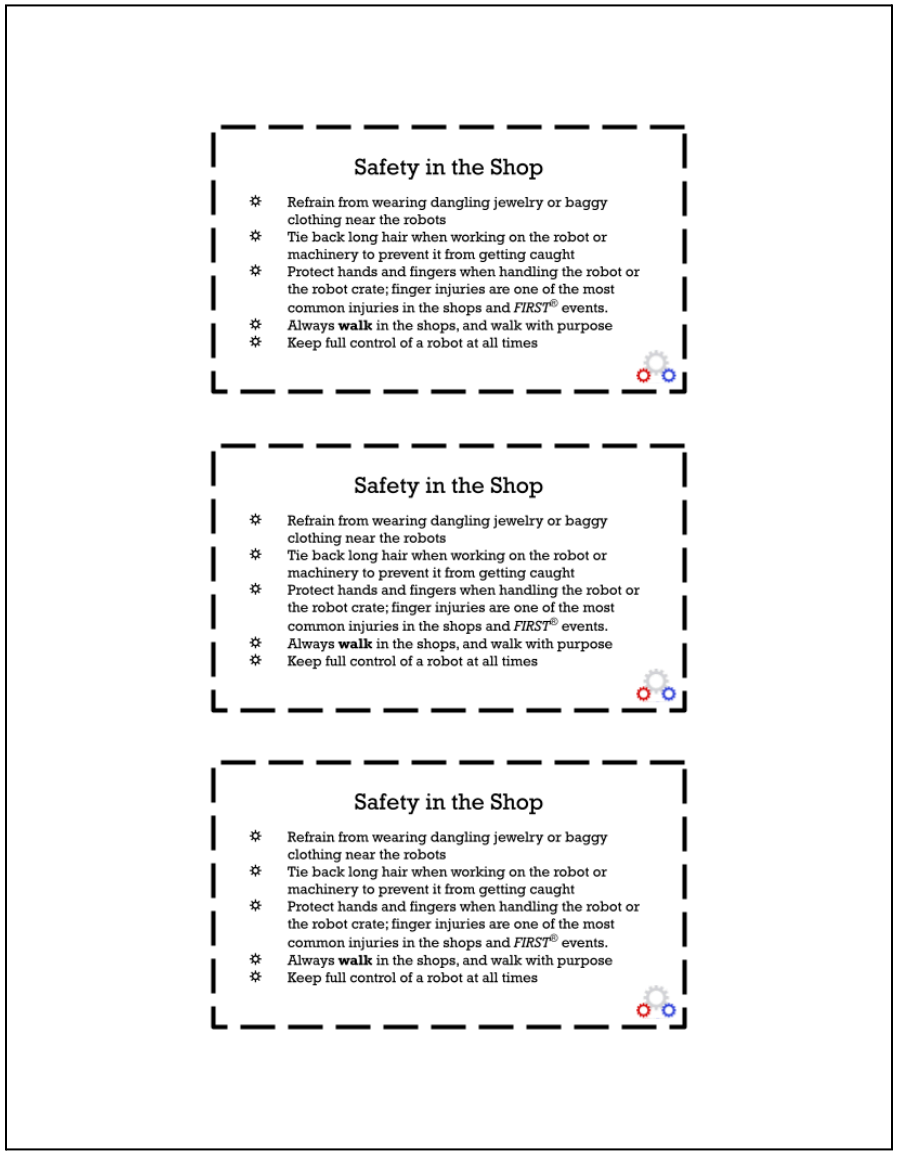
Enforcer (Lead/Mentor):_____

Consequence for Failure to Follow:_____

Team Name: WorBots

Team Number: 4145

ID-142



Team Name: WorBots

Team Number: 4145

ID-143

ARE *YOU* SAFETY CERTIFIED?

Do not use this machine unless you have passed your safety certification exam!

[Insert Name]

Team Name: WorBots

Team Number: 4145

ID-144

[Team Name]: Safety Procedures

This document is to provide an overview of all of the standard safety procedures for members of [Insert Team Name Here].

All members on Team [Team Number] must adhere to the following:

- Listen to a safety presentation, presented by the Safety Lead
  - This will include all of our safety procedures such as knowing where all safety materials are (first aid kit, fire extinguisher, etc.) and the emergency evacuation plans.
- Get approved for all desired power tools (see image to the right)*
- Get an assigned pair of safety glasses*
- Wear safety goggles when power tools are active in the shop
- Follow the proper shop safety standards when power tools *or* the robot are running
  - This includes tying long hair back, removing dangling jewelry, rolling up baggy sleeves, etc.

**Returning members do not have to follow these procedures year-by-year.*

The following are notable documents to reference throughout the season:

- Power Tool Approval Roster
- Safety Instructions Sheet
- Safety Card

[Team Name]:
Power Tool Approval

Member Information

First Name:_____ Grade Level:_____

Last Name:_____ Goggle Number:_____

Previous Safety Events

Approved Tools

- ☐ Drill Press — Approved By:_____
- ☐ Power Drill — Approved By:_____
- ☐ Metal Press — Approved By:_____
- ☐ Table Saw — Approved By:_____
- ☐ Horizontal Bandsaw — Approved By:_____
- ☐ Power Sander — Approved By:_____
- ☐ Miter Saw — Approved By:_____
- ☐ Band Saw (Wood) — Approved By:_____
- ☐ Band Saw (Metal) — Approved By:_____
- ☐ Hand Tools — Approved By:_____
- ☐ _____ — Approved By:_____
- ☐ _____ — Approved By:_____
- ☐ _____ — Approved By:_____
- ☐ _____ — Approved By:_____
- ☐ _____ — Approved By:_____

[Team Name]:
Shop Safety Procedures

Rule 1:_____
Description:_____
Enforcer (Lead/Mentor):_____
Consequence for Failure to Follow:_____

Rule 2:_____
Description:_____
Enforcer (Lead/Mentor):_____
Consequence for Failure to Follow:_____

Rule 3:_____
Description:_____
Enforcer (Lead/Mentor):_____
Consequence for Failure to Follow:_____

Rule 4:_____
Description:_____
Enforcer (Lead/Mentor):_____
Consequence for Failure to Follow:_____

Rule 5:_____
Description:_____
Enforcer (Lead/Mentor):_____
Consequence for Failure to Follow:_____

Team Name: WorBots

Team Number: 4145

ID-145

[Team Name]: Safety Stock

- ❑ First Aid Kit
  - ❑ Bandaids
  - ❑ Antibacterial
  - ❑ Ice Pack
  - ❑ Ace Bandages
  - ❑ Body Fluid Cleanup Kit
  - ❑ Hair Ties
- ❑ Goggles
  - ❑ Chemical Goggles
  - ❑ Goggle Sanitizer
- ❑ Fire Extinguisher
- ❑ Eye Wash Station
- ❑ Battery Spill Cleanup Kit
  - ❑ Baking Soda
  - ❑ Acid-Resistant Gloves
  - ❑ Shop Towels
  - ❑ Battery Box
- ❑ Work Gloves
- ❑ Safety Posters
- ❑ Earplugs

Team Name: WorBots

Team Number: 4145

ID-146

Welcome to the Lab

For your safety, please follow these rules while working:

- Wear your safety goggles while using tools and while machines are running
- No running
- Wear appropriate clothing
  - Closed-toe shoes
  - No loose clothing
  - Tied back hair
- Get certified before using machines
- Clean up your workspace
  - Tools put away
  - Unplug power rolls
  - Sweep workbench and floor
- Report any accidents to the Safety Captain and appropriate mentor immediately and address any medical issues
- Stay alert at all times!

Team Name: WorBots

Team Number: 4145

ID-147

CLIPSE

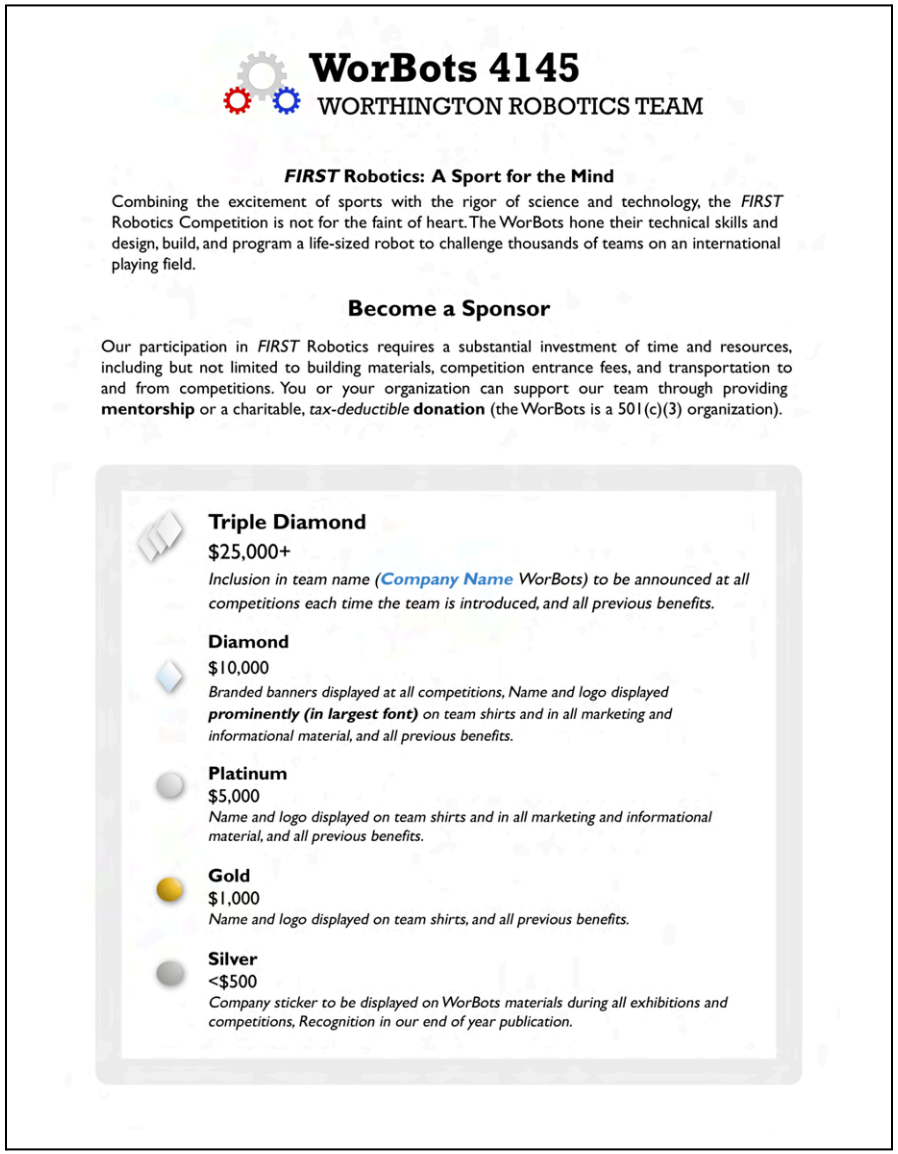
2023

TECHNICAL BINDER

Team Name: WorBots

Team Number: 4145

ID-148



WorBots 4145

WORTHINGTON ROBOTICS TEAM

FIRST Robotics: A Sport for the Mind

Combining the excitement of sports with the rigor of science and technology, the *FIRST* Robotics Competition is not for the faint of heart. The WorBots hone their technical skills and design, build, and program a life-sized robot to challenge thousands of teams on an international playing field.

Become a Sponsor

Our participation in *FIRST* Robotics requires a substantial investment of time and resources, including but not limited to building materials, competition entrance fees, and transportation to and from competitions. You or your organization can support our team through providing **mentorship** or a charitable, *tax-deductible* **donation** (the WorBots is a 501(c)(3) organization).

Triple Diamond

$25,000+

*Inclusion in team name (**Company Name** WorBots) to be announced at all competitions each time the team is introduced, and all previous benefits.*

Diamond

$10,000

*Branded banners displayed at all competitions, Name and logo displayed **prominently (in largest font)** on team shirts and in all marketing and informational material, and all previous benefits.*

Platinum

$5,000

Name and logo displayed on team shirts and in all marketing and informational material, and all previous benefits.

Gold

$1,000

Name and logo displayed on team shirts, and all previous benefits.

Silver

<$500

Company sticker to be displayed on WorBots materials during all exhibitions and competitions, Recognition in our end of year publication.

Team Name: WorBots

Team Number: 4145

ID-149

Worthington *FIRST* Pathway

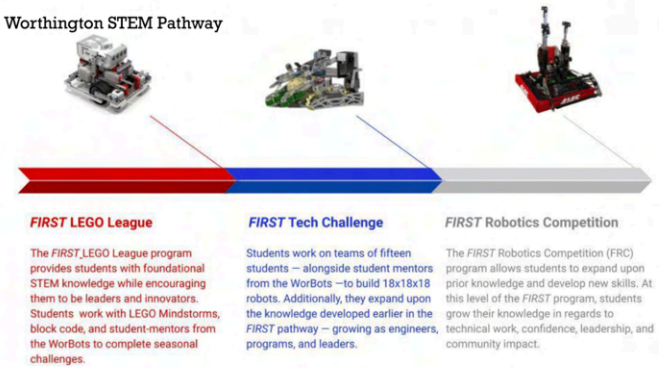
About *FIRST*

- *FIRST*: **F**or the **I**nspiration and **R**ecognition of **S**cience and **T**echnology
- The *FIRST* program encourages students to develop fundamental skills, encouraging students to become confident, lifelong learners.
- Students in the *FIRST* program learn the importance of Gracious Professionalism™ — meaning they learn respect for one another and their community, regardless of who their competitors during a match are.
- Through the *FIRST* program, students will develop long-lasting relationships. Not only do students receive the opportunity to meet and work with teams from across the world, but students can also acquire internships during or after their high school career.
- There are options for all students. The *FIRST* program promotes inclusion, and it offers opportunities for students to enrich their interest while participating in a *FIRST* team and developing their knowledge. Whether students are interested in designing, building, programming, marketing, bettering their community, or anything else, they have a place within *FIRST*.

Impact of *FIRST* on Worthington

- There is a higher interest in STEM pursuance, with 93% of the high school robotics team looking to pursue STEM — with 53% of current WorBots citing *FIRST* involvement as the reason why.
- More opportunities are available for young students to explore STEM outside of the school day.
- There is a continuously-developing culture of STEM in the Worthington community.

The Worthington STEM Pathway



FIRST LEGO League

The *FIRST* LEGO League program provides students with foundational STEM knowledge while encouraging them to be leaders and innovators. Students work with LEGO Mindstorms, block code, and student-mentors from the WorBots to complete seasonal challenges.

FIRST Tech Challenge

Students work on teams of fifteen students — alongside student mentors from the WorBots —to build 18x18x18 robots. Additionally, they expand upon the knowledge developed earlier in the *FIRST* pathway — growing as engineers, programs, and leaders.

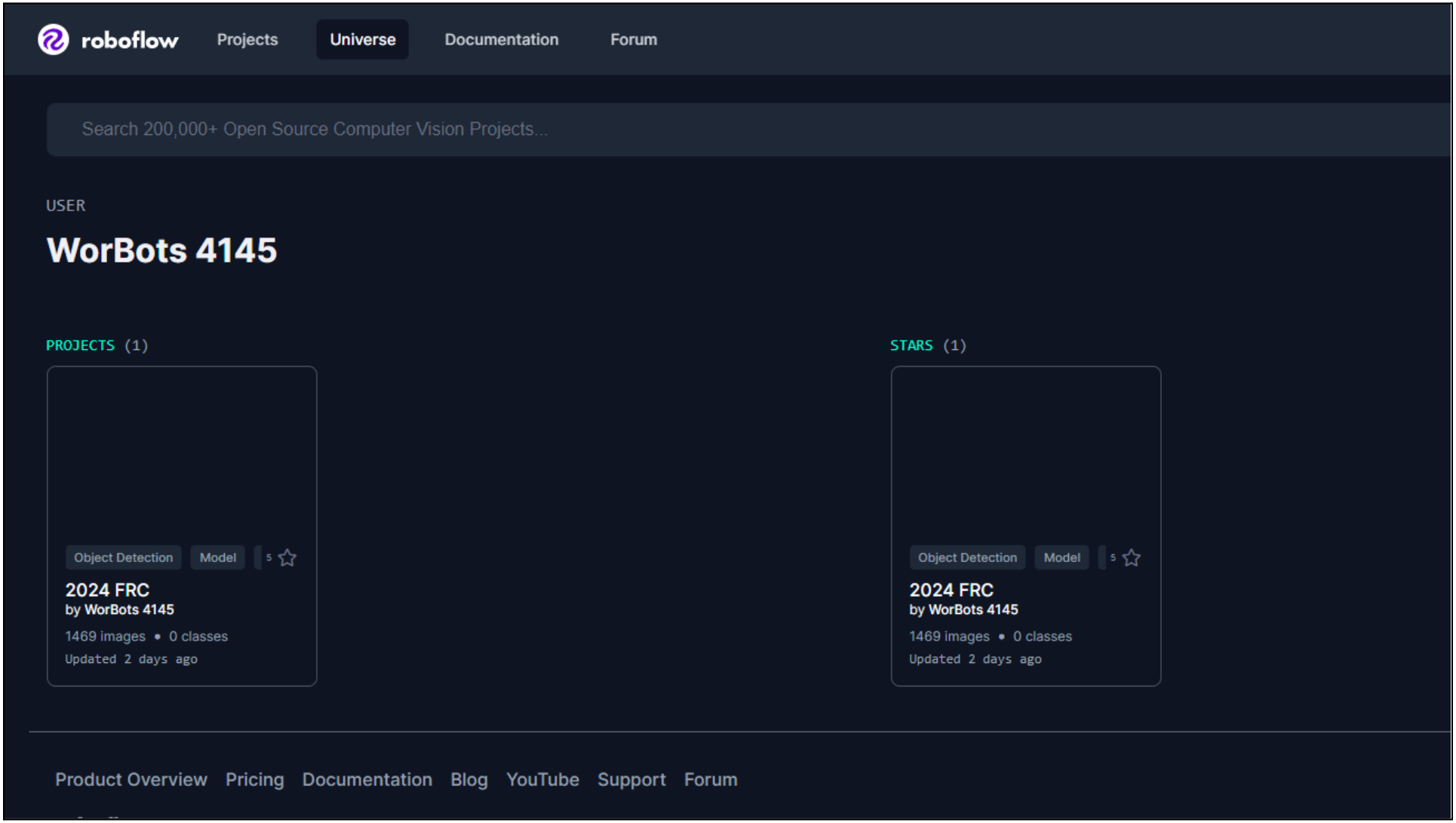
FIRST Robotics Competition

The *FIRST* Robotics Competition (FRC) program allows students to expand upon prior knowledge and develop new skills. At this level of the *FIRST* program, students grow their knowledge in regards to technical work, confidence, leadership, and community impact.

Team Name: WorBots

Team Number: 4145

ID-150



Team Name: WorBots

Team Number: 4145

ID-151

Team Name: WorBots

Team Number: 4145

ID-152

Team Name: WorBots

Team Number: 4145

ID-153

Team Name: WorBots

Team Number: 4145

ID-154

Team Name: WorBots

Team Number: 4145

ID-155

Team Name: WorBots

Team Number: 4145

ID-156

Team Name: WorBots

Team Number: 4145

ID-157

Team Name: WorBots

Team Number: 4145

ID-158

Team Name: WorBots

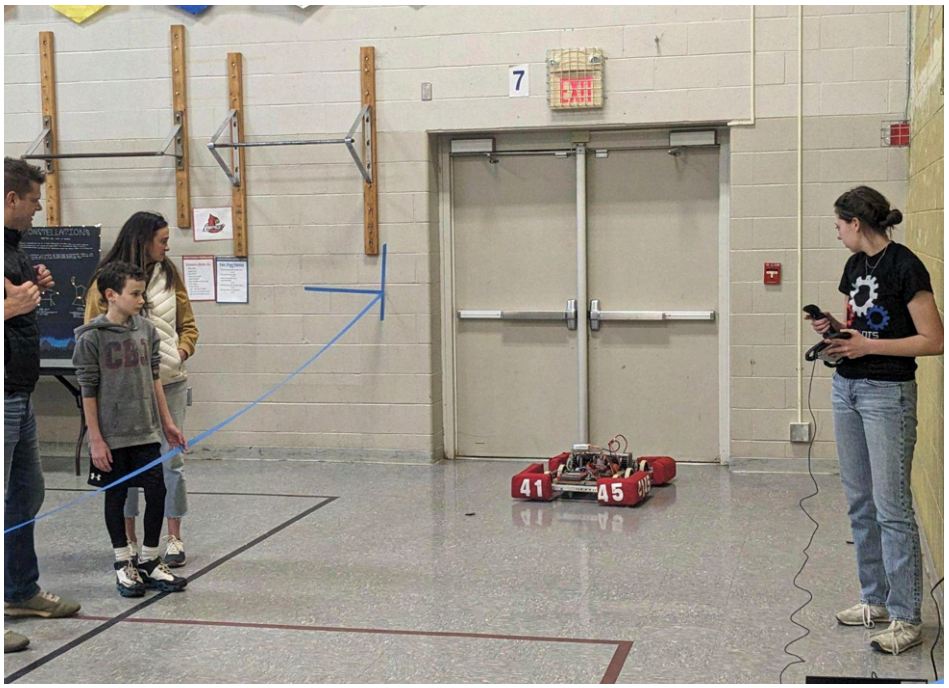
Team Number: 4145

ID-159

Team Name: WorBots

Team Number: 4145

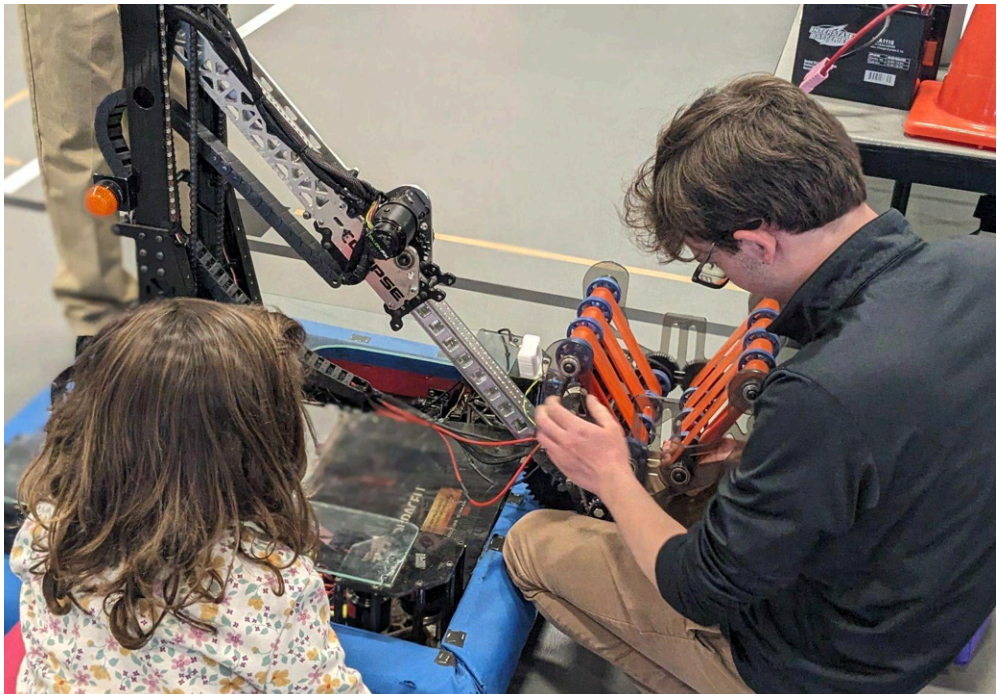
ID-160



Team Name: WorBots

Team Number: 4145

ID-161



Team Name: WorBots

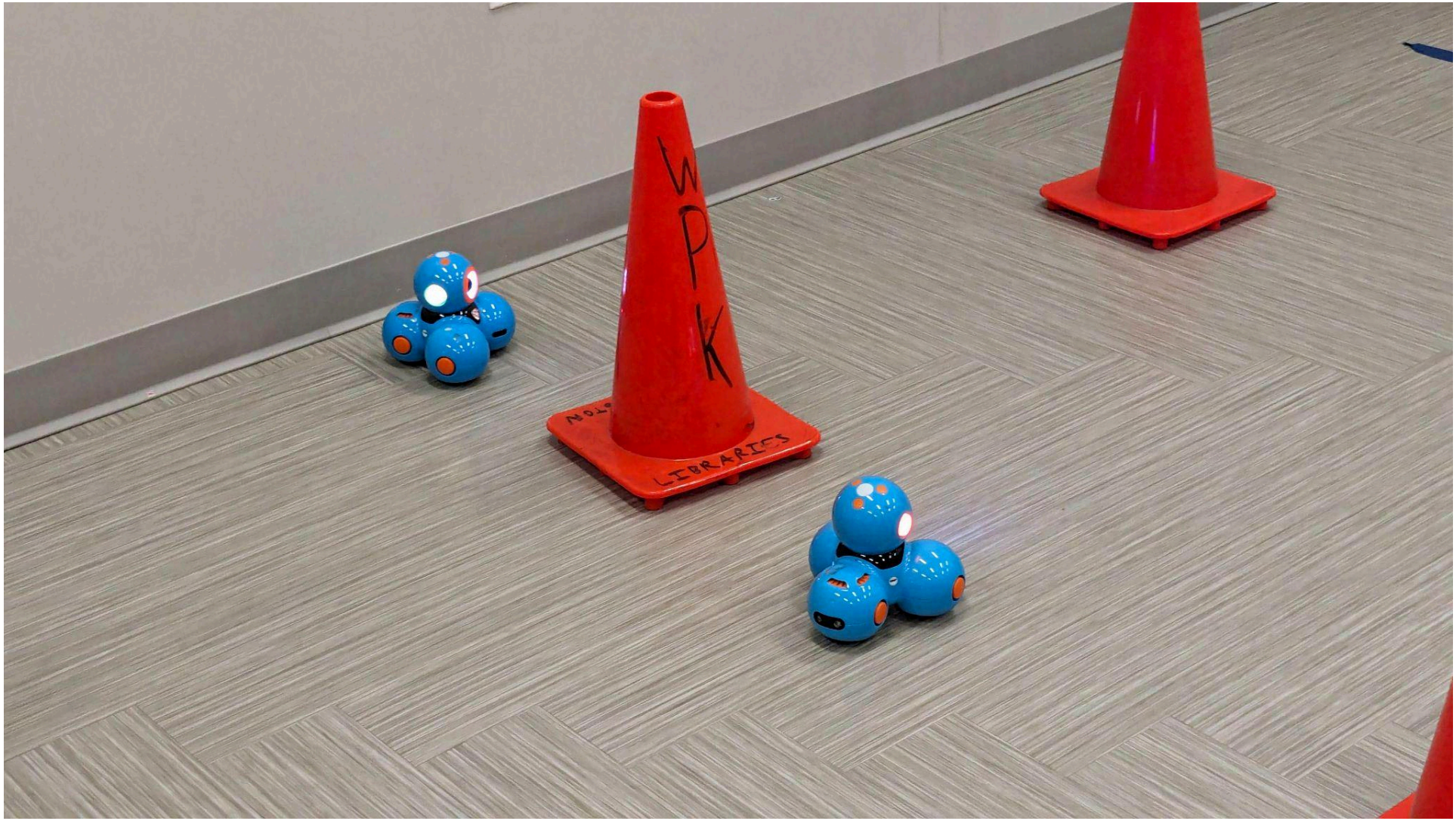
Team Number: 4145

ID-162

Team Name: WorBots

Team Number: 4145

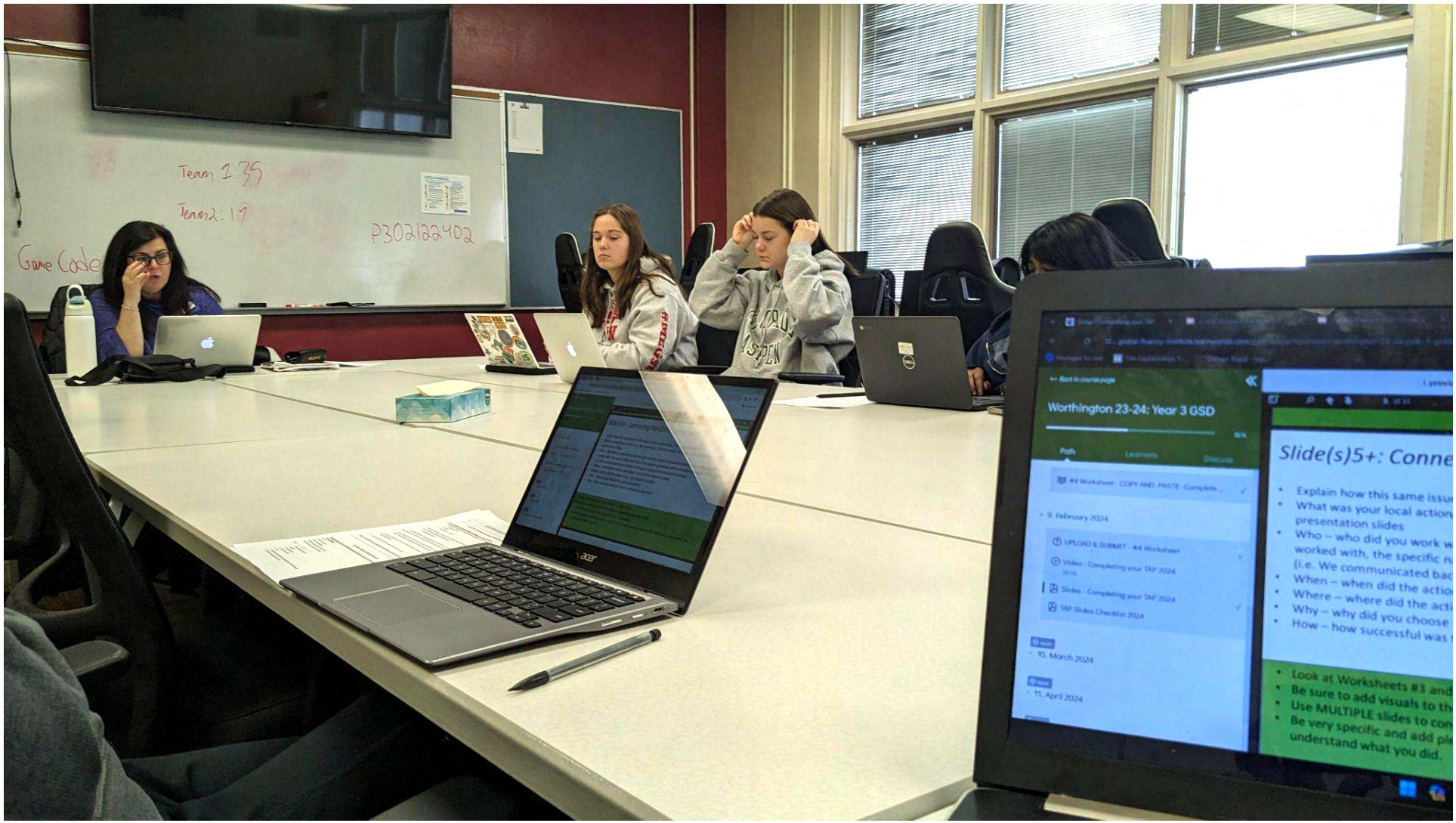
ID-163



Team Name: WorBots

Team Number: 4145

ID-164



Team Name: WorBots

Team Number: 4145

ID-165

FRC
FINALIST
FINALIST
FINALIST