Team Stats

7% of our high school is on our FRC team
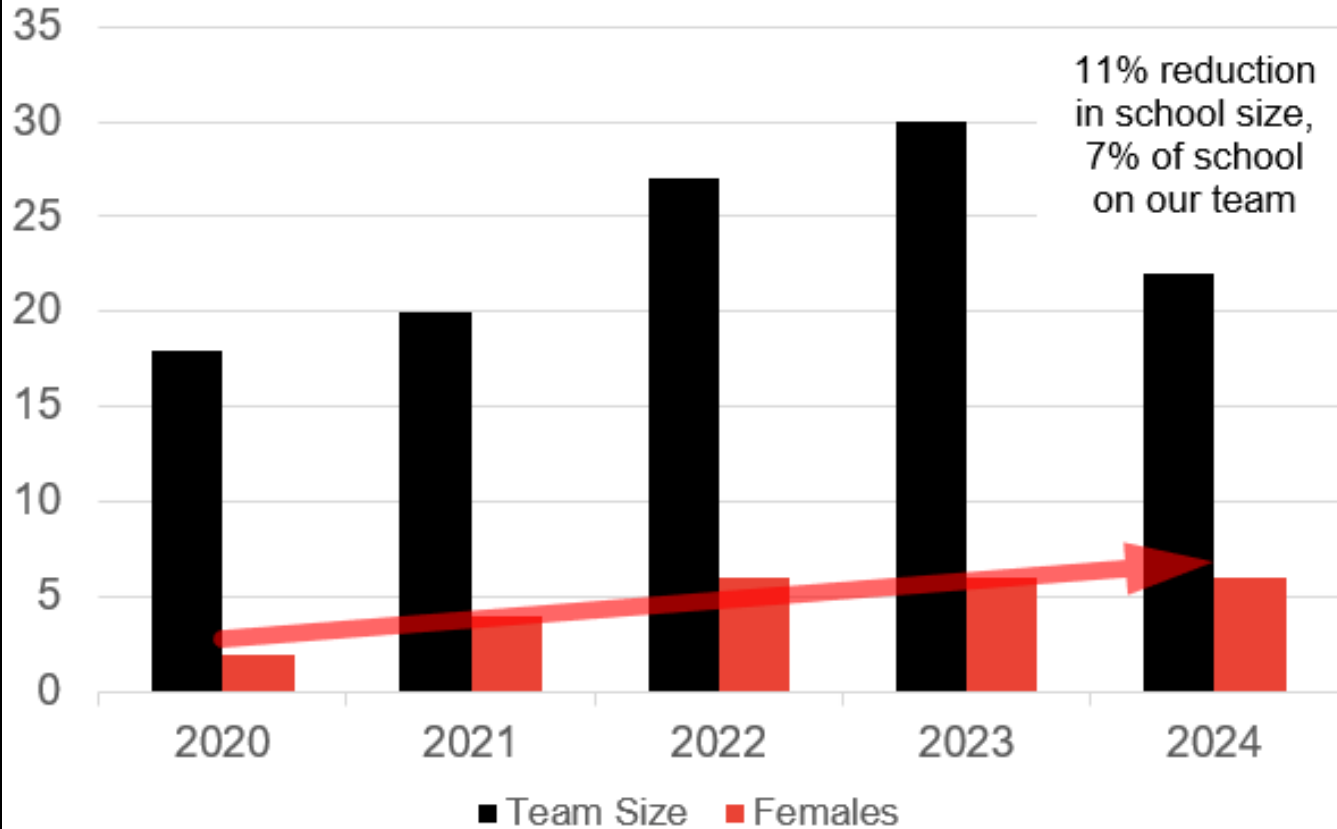
2024 Team Statistics

- Seniors — 32%
- Juniors — 32%
- Sophomores — 32%
- Freshmen — 5%

GEMS Team 4362 - Growing Our Team

11% reduction in school size, 7% of school on our team

Team Size / Females

2020, 2021, 2022, 2023, 2024
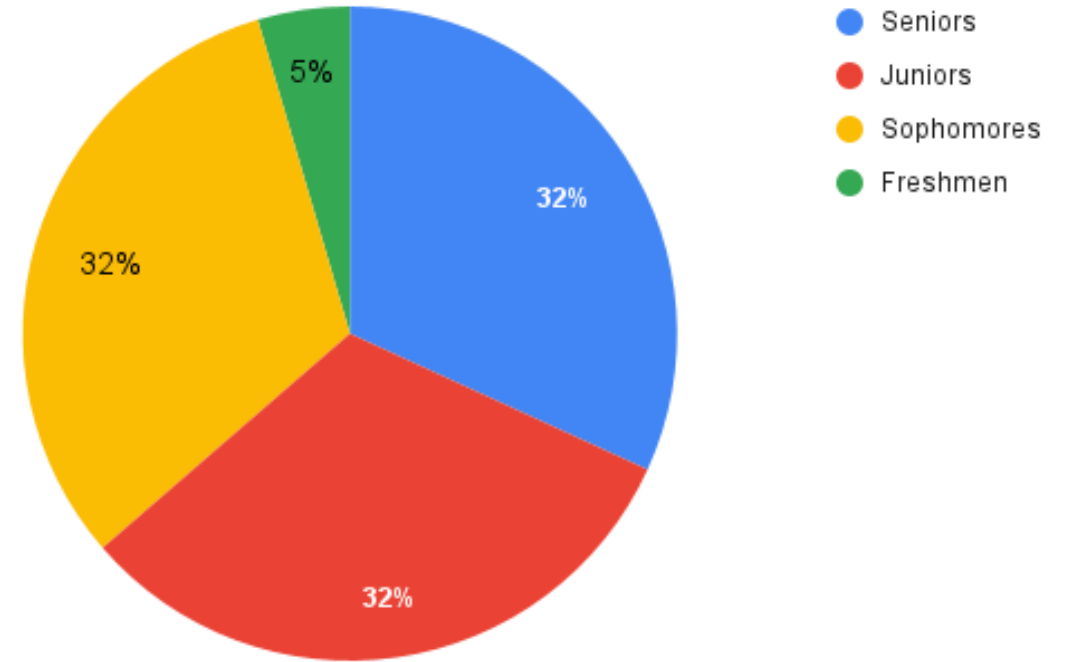
Back to Team Structure

Coach

Electrical | Programming | Drive Team | Mechanical | Business & Awards | Creative Media | Strategy | CAD

Student Leader (×8)

Safety Captain

Mentor(s) (×8)

Team Members

Back to Team Structure

2024 Students

Back to Team Structure

Our Robot - 2024
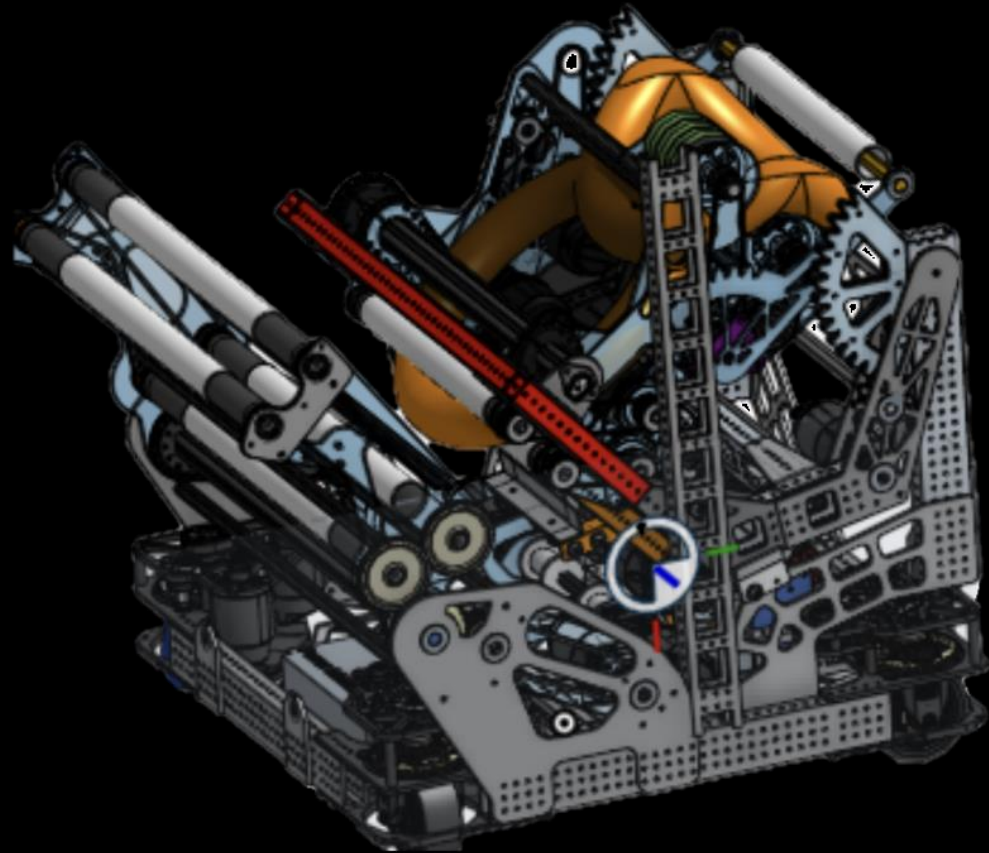
Climber

Note Bender

Basic Stats

Intake

Shooter

The Arm

Basic Stats

Fun Facts:
- 100.4 lbs
- 25 x 25 x 25 chassis
- Robot fits under stage
- LED's on robot communicate intake and shot position status

Auton:
- 4 note auton on source side
- 5 note auton on amp side

Teleop/End Game:
- Over the bumpers ground intake
- Shot distance from subwoofer to back of stage
- Score into Amp
- 3-5 second climb

(We can score 16-18 notes in a match)

- Our drive and swerve motors are krakens and the rest of our motors are falcons

Autons

Back to Our Robot

Autons
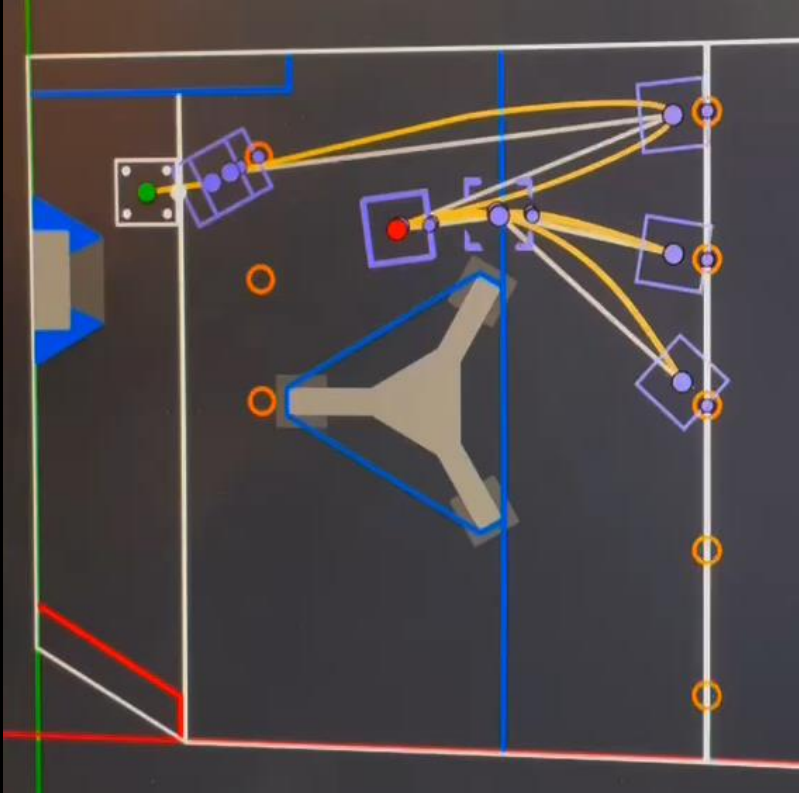
5 note Amp side
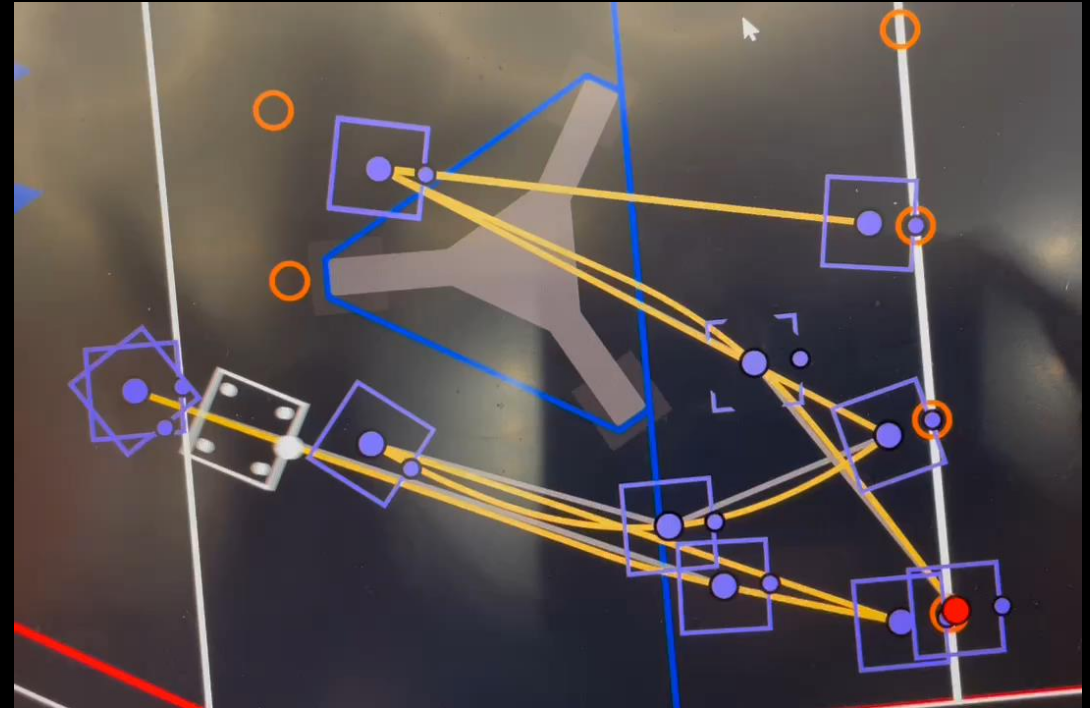
4 note Source side

Back to Basic Stats

Climber

The climber is attached to the arm and is a hook that goes over the chain and uses a winch to pull the robot up and off the ground. After each match, there is a specific sequence of steps that needs to be done to reset the climber.

After our first competition, we reconfigured the hook geometry to enable more successful harmony climbs.

Back to Our Robot

Shooter

The shooter uses flywheels to shoot a note into the speaker. The shooter has built in controls utilizing motor torque characteristics as a note is fed from the intake and positions it properly prior to the shot. The shooter is attached to the arm and auto-aims based on distance from the speaker using odometry and a lime-light to scan the april tags which enables self correcting field position. The shooter is geared to obtain a high speed before feeding a note into the flywheels and shooting the note into the speaker.

Back to Our Robot

Intake

The intake uses a torque-tube to rotate in and out of the robot. There are 4 rollers used in the intake to pull in notes. This year, we decided to implement something new with the rollers and compliant material, instead of multiple compliant wheels. The solution is lighter and more effective due to the lack of empty spaces.

One improvement that we made after our first competition this season was replacing the aluminum churro shaft in the middle of the intake. We replaced it with a polycarbonate shaft because the metal one was bending when impacted and polycarbonate is more flexible and allows the intake to resist collisions better.

Back to Our Robot

Note Bender

The note bender is a small mechanism attached to the shooter that pivots up and down to fold a note into the amp. The note bender is made with a churro bar with a carbon fiber roller bearing.

This note bender was implemented after prototype testing revealed the amp shot was not consistent. The note bender automatically deploys as the note is exiting the shooter into the amp. The note bender will also be used when we implement trapping at a later date.

The Arm

The arm is connected at 2 points and is used to raise the shooter up to the amp and allow the climber to reach the chain.

The arm and shoulder is custom designed with aluminum and polycarbonate gear set. The arm has a defined home position, using HDPE plastic blocks. The multiple arm positions are controlled utilizing the embedded falcon encoders.

Back to Our Robot

Outreach

Girls in STEM Workshops

CSA Arcade Building

Safe Town

FTC Mentoring

Color Run

Meals on Wheels

STEM Sisters

3536
9204   3668
7220   LCRA   3707
7056   4362
4776
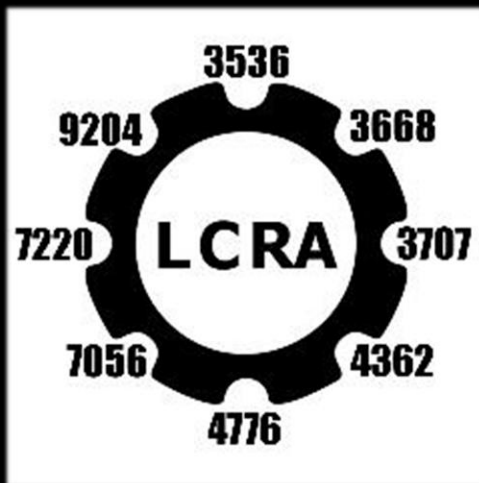
Charyl's Run2BFit

Scavenger Hunt

Livingston County Robotics Alliance

We are a founding member of the Livingston County Robotics Alliance, or LCRA. The LCRA supports each other, cheers for each other and holds community building events together. We also help to build a joint field with LCRA. STEM Sisters is a subgroup of LCRA that gets together to support girls in STEM.

Back to Outreach

Scavenger Hunt

We began an annual Scavenger Hunt in downtown Brighton in 2021. This event gives the community an opportunity to cooperatively work together solving clues. It also teaches about what FIRST's core values are, through the clues during the event.

Back to Outreach

Charyl's Run2BFit

Every year, we help host the annual Charyl's Run2BFit. At this race, we run all of the timing, which allows us to be more involved in the community and show our computer skills.

Back to Outreach

Color Run

Every year, we attend our school's annual Color Run with our robot. At this event, people get to learn about robotics when they see our robot in action! This allows us to share the FIRST core values and mission to all who attend the event.

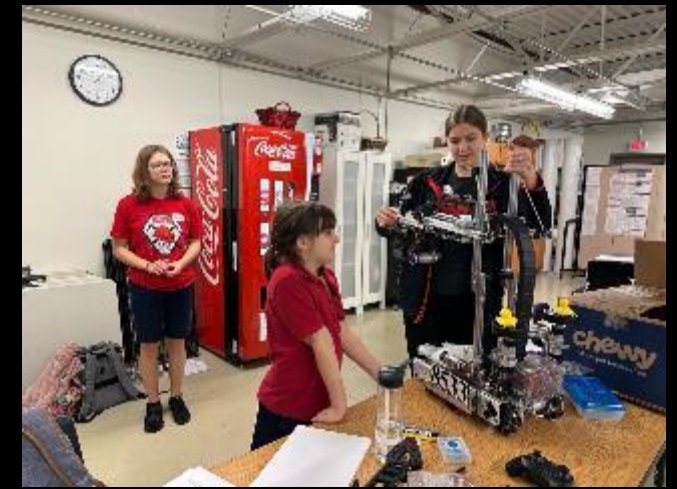Back to Outreach

Girls in STEM Workshops

In 2023, we began an annual Girls in STEM robotics workshop. At this event, CSA elementary students, K-3, get to learn all about what robotics is. We teach the girls what parts of the robot are, basic coding, driving robots, and how to build their own prototype robot! For the girls that were Girl Scouts, they earned their robotics badges.

Back to Outreach

FTC Mentoring

In 2021, we had four students mentor the FTC teams, 8533 and 17207. We've grown that number to 8 student mentors, and it is growing each year. The mentors help to teach the FTC students how to drive the robot, code, scout, strategize and prepare for presentations.

Females on FTC Teams
Miners (8533) & Prospectors (17207)

Female GEMS Recruiting & Drive Coach Began

GEMS
TEAM 4362
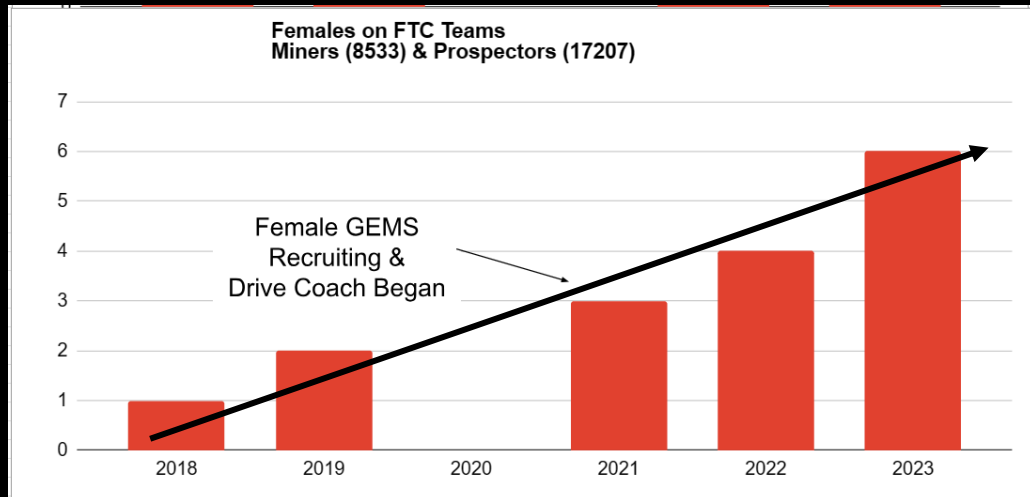
Back to Outreach

Safe Town

Over the summer, we partnered with General Motors to attend 4 summer camps called Safe Town, reaching over 100 kids. At these camps, we helped GM gather seat suppression data, as well as demonstrating safe seat belt use and being safe in and around vehicles. The data we helped collect was to determine when an air bag should be on or off if a child is in the front seat. We also brought a demo robot to demonstrate driver distraction to the kids.

CSA Arcade Building

This season, we volunteered in the kindergarten classes at our elementary school. Since the kids were building their own arcade games, we assisted them as "build experts", helping them to cut materials and assemble their games. It was so fun to see their designs come to life and the happiness it brought the kids to have high schoolers assisting them.

Back to Outreach

Meals on Wheels

This holiday season, we wrapped over 300 gifts wrapped for families in need for Christmas.

Back to Outreach

Environment

In 2022 & 2023, we partnered with General Motors to provide a household battery recycling kiosk at our pit, educating teams and our school on the importance of recycling batteries, recycling over 200 pounds of batteries, making the world a cleaner place, one battery at a time!

We recycle aluminum at our shop as a way to fund our team while also caring for the environment. We also recycle the used crayons from our coloring books.

Tree Story

Our GEM Tree Story

We are inclusive, appreciating that everyone is unique, like the gem leaves of our tree

We branch out to the community

We rely on each other to succeed as a whole team

We have deep roots in our school & community

We rely solely on fundraising and generous sponsors (we are not eligible for school bonds)

We grow through our mentoring & recruiting of FTC & FLL

We keep our soil healthy by recycling batteries and promoting STEM

We are more than robots!
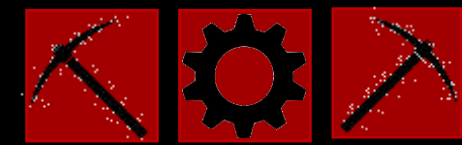
Back to Environment

Team History

FIRST team 4362, originally known as Gem2 was founded in 2012 by Susan Heiss, a science teacher at the newly founded Charyl Stockwell Preparatory Academy High School (CSPA). That year the team combined students from CSPA and Kensington Woods, both small charter high schools.

Creation of Our Name

Team Achievements

Creation of Our Name

The GEMS name was first created because when you look at a keypad and use 436- it translates to GEM, thus the first iteration of the name: GEM2. This shortly got changed to GEMZ (the z looking like the 2 but also being much easier to say). The next (and final) iteration was changing the z to an s, thus creating the GEMS!

Back to Team History

Team Achievements

2012

- Won the Livonia District "Rookie All-Star" Award
- Won the Gull Lake District "Rookie All-Star" Award

2013

- Won the Livonia District Xerox "Creativity" Award

2014

- Won the Midland off-season Competition "Fired Up Bot" Award
- Won the Howell District Motorola "Quality" Award
- Won the Livonia District GM "Industrial Design" Award
- Won the Michigan State Championship GM "Industrial Design" Award
- Qualified for the World Championship

Return to Team History

Team Achievements

2015

- Won the Howell District Event
- Alliance Captain at the Michigan State Championship
- 4th seeded Alliance Captain at the World Championship

2016

- Won the Kettering District Motorola "Quality" Award
- Won the Howell District Xerox "Creativity" Award
- Finalists at the Howell District Event
- Semifinalists at the Michigan State Championship
- Qualified for the World Championship
- Finalists at the Kettering Kickoff off-season Competition

2017

- Won the Howell District Rockwell Automation "Innovation in Control" Award
- Finalists at the Howell District Event
- Qualified for the Michigan State Championship
- Qualified for the World Championship

Return to Team History

Team Achievements

2018

- Won Miami Valley (Ohio) Regional Event
- Won Miami Valley Regional Motorola "Quality" Award
- Won the Troy District Event
- Semifinalists at the Milford District
- Division Finalists at the Michigan State Championship
- 4th seeded Alliance Captain at the World Championship
- Finalist at the Kettering off-season event

2019

- Won the Milford District "Imagery" Award
- Won the Jackson District Event
- Won the Jackson District Delphi "Excellence in Engineering" Award
- Won the East Kentwood District Ford "Autonomous" Award
- Won the Michigan State Championship Ford Division
- Won the Michigan State Championship Ford Division Rockwell Automation "Innovation in Control" Award
- Won the Michigan State Championship!
- Qualified for the World Championship
- Won the Kettering off-season event

2020

- Season cut short due to nationwide quarantine

Return to Team History

Team Achievements

2021

- Won the Engineering Design Award

2022

- Won the Milford District Event
- Won the Milford District "Gracious Professionalism" Award
- Won the Belleville District Event
- Won the Belleville District "Team Spirit" Award
- Qualified for the Michigan State Championship
- Qualified for the World Championship
- Won the Kettering off-season event

2023

- Won the Milford District "Imagery" Award
- Won the Belleville District Event
- Won the Belleville District "Autonomous" Award
- We were finalists on the DTE Division at the FIM State Championships
- We qualified for Worlds

Return to Team History

Team Achievements

2024

- Finalists at the Milford District event

Return to Team History

Our Future

We plan on expanding our FIRST teams at our school. To do this, we plan on fundraising to purchase more FLL kits for the elementary students, who do not have the funding to purchase the kits themselves. We also plan on providing more mentorship to the FLL and FTC teams, which will hopefully lead to an increase in our FRC team, when the students get to high school.

We plan on partnering with General Motors, one of our sponsors, to teach young students. This event would teach the elementary students about a real-world application of engineering and how to be safe in and around vehicles, including the importance of wearing a seat belt/using a child restraint system. At this event, there would be data collection for GM, a child crash test dummy and demo vehicles, an interactive egg mobile demonstration and a robotics demo. In fact, we did this event over the summer! Please take a look at Safe Town in the Outreach section.

Team Mission

As a high school robotics team, our mission is for students to develop a love for science and technology. Participating in this program leads to important life skills including self-confidence, communication and leadership. This team inspires students to become science, technology and business leaders, and every member has the opportunity for participation and growth. We also aspire to reach into our community and push the frontier of science and technology both locally and globally. FIRST helps provide students with the tools they need for a career to make a difference in the world. Our students work side by side with mentors who endeavor to provide experience and support. Our team strives to develop lasting fellowships with sponsors, networking with other teams and provide outreach within the community.

What is FIRST?

Gracious Professionalism® is a way of doing things that encourages high quality work, emphasizes the value of others, and respects individuals and the community.

Coopertition® is displaying kindness and respect in the face of fierce competition.

The FIRST Community expresses the FIRST philosophies of Gracious Professionalism® and Coopertition® through their Core Values.

FIRST® Robotics Competition for grades 9-12

FIRST® Tech Challenge for grades 7-12

FIRST® LEGO® League for grades Pre-K-8

Core Values:
- Discovery
- Innovation
- Impact
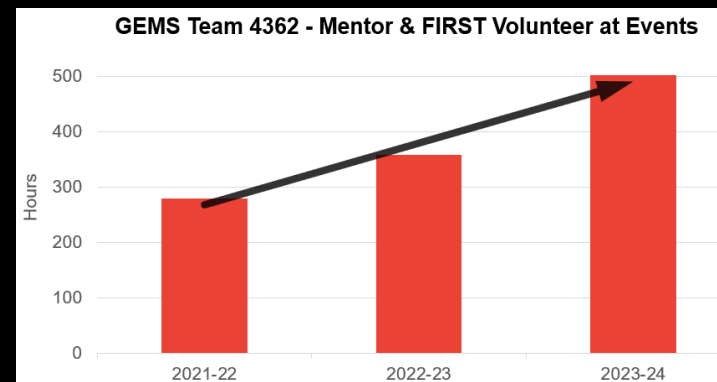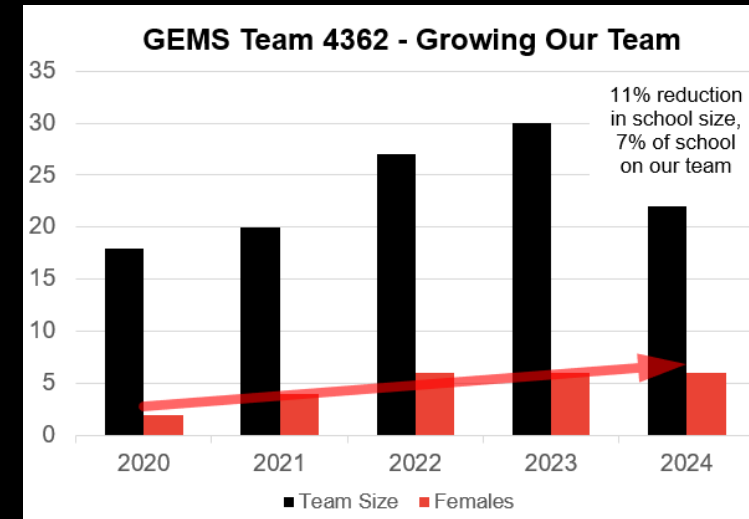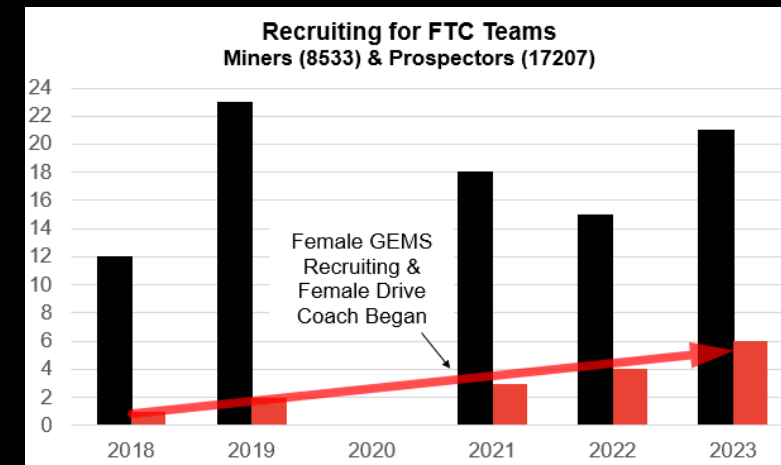- Inclusion
- Teamwork
- Fun

Return to Team Mission

Our Impact

✓ **Recruitment & Outreach IS working**
- Our FTC and FRC teams are increasing
- 7% of our high school (22/314) is on our FRC team
- Females on our team is increasing (FTC & FRC)
- 502 Hours of Mentoring and FIRST Volunteering
- Kids love our events

✓ **We ARE Reaching the Community**
- Partnered with GM for Engineering & Robot Demo
- Number of sponsors is increasing
- Attendance at our events is increasing
- Our Social Media presence is increasing

✓ **We ARE Planning & Advocating for the Future**
- Youth Advisory Council Representative
- Met with Principal - increase STEM awareness
- Recruiting for FLL, FTC & FRC teams
- STEM Sisters with LCRA
- Co-Volunteer Coordinator
  & Key Roles at Ann Arbor Event

Recruiting for FTC Teams
Miners (8533) & Prospectors (17207)

Female GEMS Recruiting & Female Drive Coach Began

GEMS Team 4362 - Growing Our Team

11% reduction in school size, 7% of school on our team

■ Team Size ■ Females

GEMS Team 4362 - Mentor & FIRST Volunteer at Events

Sponsors - 2024

Fundraising and Generous Sponsors Completely Fund our Program

GEMtastic Student

Luke B.
AKA Kevin
Class of 2025

- Drive Team (Driver)
- Mechanical

Favorite memory of robotics: Eating pit snacks

Something I learned: I am possibly a better welder than mentor Karsen

Fun Fact: I will respond when called "Kevin"

Back to Team Composite

GEMtastic Student
Daniel B.

Class of 2026

◆ Drive Team (Technician)
◆ Strategy
◆ Controls

Favorite memory of robotics: Being on the drive team in FTC
Something I learned: How singletons work in Java
Fun Fact: I lived in Japan for a couple of years when I was younger

Back to Team
Composite

GEMtastic Student

Chris B.

AKA Kevin

Class of 2025

◆ Mechanical
◆ Electrical
◆ Pit Crew

Favorite memory of robotics: When our team won our first competition of the Rapid React season

Something I learned: I learned how many of the different mechanical systems and electrical components on a robot work

Fun Fact: I know a lot about computers

Back to Team Composite

GEMtastic Student

Joe C.

Class of 2025

💎 Electrical

Favorite memory of robotics: Meeting new people and playing sports at Houston
Something I learned: I have a passion for electrical engineering
Fun Fact: I play 3 sports in addition to robotics

GEMS
TEAM 4362

Back to Team
Composite

GEMtastic Student
Will C.
Class of 2026

💎 Pit crew

Favorite memory of robotics: Hanging out with friends

Something I learned: What a torx bit is

Fun Fact:

Back to Team Composite

GEMtastic Student

Jack C.

Class of 2026

◆ Scouting

Favorite memory of robotics: Learning about welding
Something I learned: CAD
Fun Fact: I used to have an exotic bird

Back to Team Composite

GEMtastic Student
Zach D.

Class of 2025

- ◆ Drive team (Human Player)
- ◆ CAD
- ◆ Strategy

Favorite memory of robotics: Going to states in 2022
Something I learned: How to 3d build and bring it to life
Fun Fact: I plan to be a mechanical engineer

Back to Team Composite

GEMtastic Student
Cooper F.
Class of 2024

◆ Scouting

Favorite memory of robotics: Winning states when I was in middle school
Something I learned: Programming
Fun Fact: I've seen 29 seasons of The Simpsons

Back to Team Composite

GEMS
TEAM 4362

GEMtastic Student
Grant H.

Class of 2024

♦ Strategy
♦ Scouting

Favorite memory of robotics: Spending time with the team at the hotel at States last year
Something I learned: Organizing and setting up procedures for scouting
Fun Fact: I ran a D & D campaign for 2 years

Back to Team Composite

GEMtastic Student

Carter H.

Class of 2024

◆ Scouting

Favorite memory of robotics: Competitions
Something I learned: How to cut wood using a hand saw and how to use procreate
Fun Fact: I have 5 birds, 4 parakeets and 1 cockatiel

Back to Team
Composite

GEMtastic Student
Kaleb K.
Class of 2025

♦ Scouting

Favorite memory of robotics:
Something I learned:
Fun Fact:

Back to Team Composite

GEMtastic Student
Kadence M.

Class of 2027

♦ Scouting
♦ Art

Favorite memory of robotics: I love the competitions!

Something I learned: What robotics is, at first I thought it was battle bots. I learned about all the subgroups and the teamwork.

Fun Fact: I've watched Adventure Time about a million times, love it!

Back to Team Composite

GEMtastic Student

Alexi M.

Class of 2025

◆ Business & Awards

Favorite memory of robotics: Even after winning against a good team, they still cheered for us as we moved into the semi-finals. This gracious spirit really stuck with me.
Something I learned: Teamwork can either make or break the team
Fun Fact: I have a dog

Back to Team Composite

GEMtastic Student

Riley M.

Class of 2025

🔴 Creative Media

Favorite memory of robotics: Talking to people at competitions like we've known each other for years
Something I learned: More communication skills
Fun Fact: The team inspired robotics in me

Back to Team Composite

GEMtastic Student

Lizzy N.

Class of 2024

- Drive Team (Operator)
- Awards & Business
- FTC Mentor
- Dean's List 2023 Semi-Finalist

Favorite memory of robotics: The competitions because we are all working cooperatively and gracious together
Something I learned: How to prepare for talking to judges and public speaking.
Fun Fact: I enjoy spending time outside and I have lots of pets!

Back to Team Composite

GEMtastic Student

Danny R.

Class of 2024

- Controls
- Scouting

Favorite memory of robotics: The excitement of the competitions

Something I learned: How to use CAD programs

Fun Fact: On a previous robotics team, I created the CAD model of the robot by myself, since there wasn't anyone else on the CAD subteam.

Back to Team Composite

GEMtastic Student

Rowan R.

Class of 2026

🔷 Pit Crew

Favorite memory of robotics: The true tie at Belleville
Something I learned:
Fun Fact:

GEMtastic Student

Reese R.

Class of 2024

♦ Scouting

♦ Art

Favorite memory of robotics:

Something I learned:

Fun Fact:

Back to Team Composite

GEMtastic Student
Sam S.

Class of 2025

💎 Strategy

Favorite memory of robotics: The dramatic scoring during competitions
Something I learned: learned a lot about CAD in particular, as well as about match strategy and alliance selection.
Fun Fact: I am a Warhammer 40K fan

Back to Team Composite

GEMtastic Student
Kyle T.
AKA Kevin
Class of 2024

◆ Mechanical
◆ Pit Crew

Favorite memory of robotics: Milford last year, because it was my first competition we won on the 4th tiebreaker in finals

Something I learned: How to think through designs and come up with quick and practical solutions

Fun Fact: I've had my orv, snowmobiling, and boating license since I was 12

Back to Team Composite