

# Rapid Robots

FTC team from Novi Middle School

# About First



FIRST® is the world's leading nonprofit for youth advancing STEM education.

FIRST combines the rigor of STEM learning with the fun and excitement of traditional sports and the inspiration that comes from community through programs that have a proven impact on learning, interest, and skill-building inside and outside of the classroom.

## FIRST By The Numbers



**2.5 million+** student participants impacted in **100+** countries since 1989



**Millions of** volunteer hours served annually



**Thousands of** events held each year




**81% of FIRST alumni** declare a STEM major by their fourth year in college (compared to 68% of peers in *FIRST Longitudinal Study*)




**50% of female FIRST alumni** declare a major in engineering or computer science by their fourth year of college (compared to 14% of peers in *FIRST Longitudinal Study*)

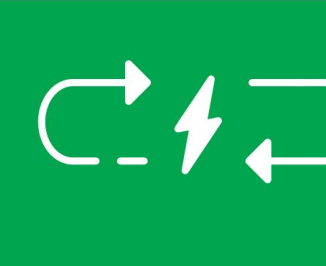
# Benefits - FIRST Core Values



**Discovery**  
We explore new skills and ideas.




**Innovation**  
We use creativity and persistence to solve problems.



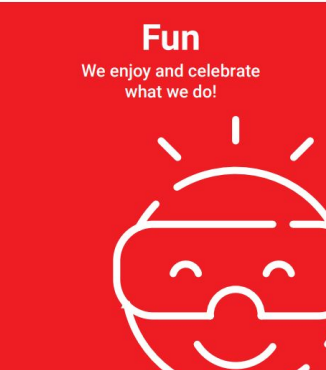
**Impact**  
We apply what we learn to improve our world.



**Inclusion**  
We respect each other and embrace our differences.



**Teamwork**  
We are stronger when we work together.



**Fun**  
We enjoy and celebrate what we do!

## ***Gracious Professionalism***

*Gracious Professionalism* is part of the ethos of FIRST. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

It is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing one has acted with integrity and sensitivity.

## ***Coopertition***

*Coopertition* is displaying unqualified kindness and respect in the face of fierce competition. It is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete.

*Coopertition* involves learning from teammates. It is teaching teammates. It is learning from Mentors. And it is managing and being managed. *Coopertition* means competing always, but assisting and enabling others when you can.

# FIRST Robotics Programs



## ***FIRST*** in Michigan

**FIRST**  
ROBOTICS  
COMPETITION

HIGH  
SCHOOL

**FIRST**  
TECH  
CHALLENGE

MIDDLE  
SCHOOL

**FIRST**  
LEGO  
LEAGUE

CHALLENGE

UPPER  
ELEMENTARY

**FIRST**  
LEGO  
LEAGUE

EXPLORE

KINDERGARTEN  
- GRADE 3

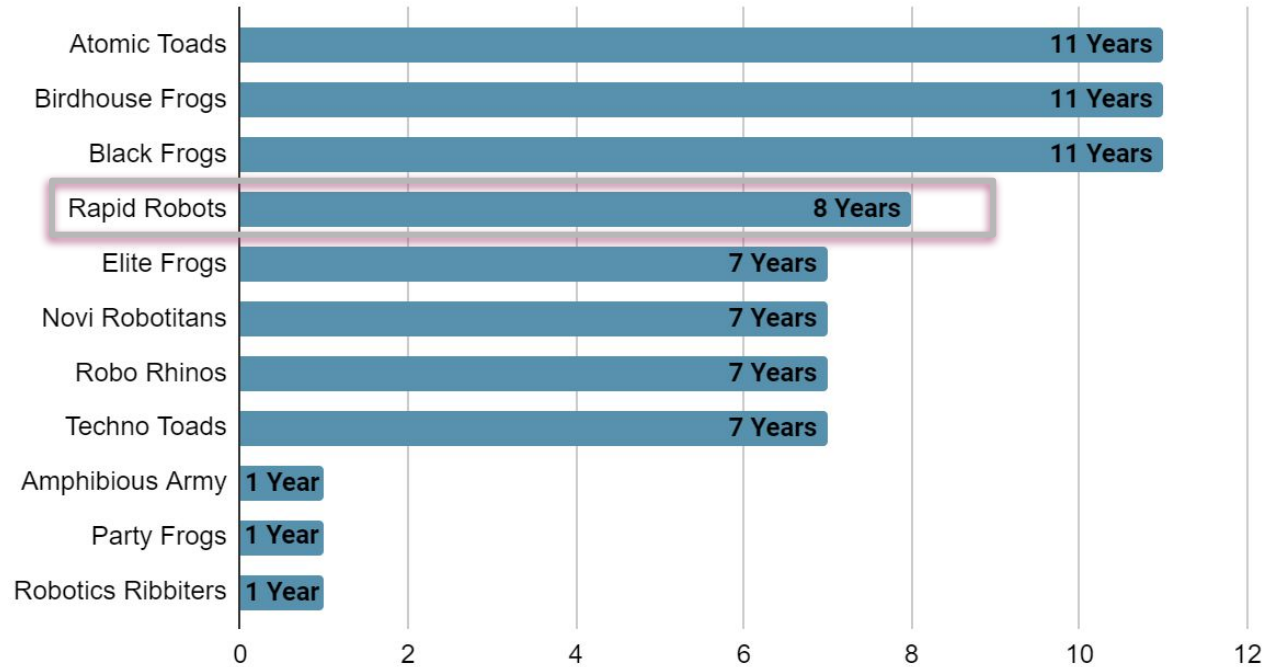
**FIRST**  
LEGO  
LEAGUE

DISCOVER

PRESCHOOL

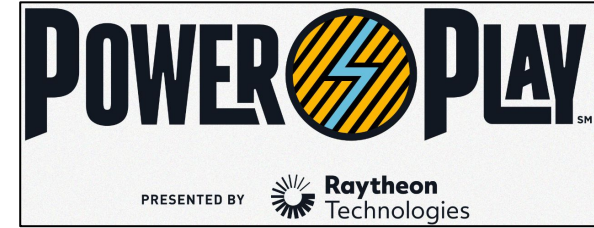
# Overview of FTC Teams in Novi

## Years Since Inception

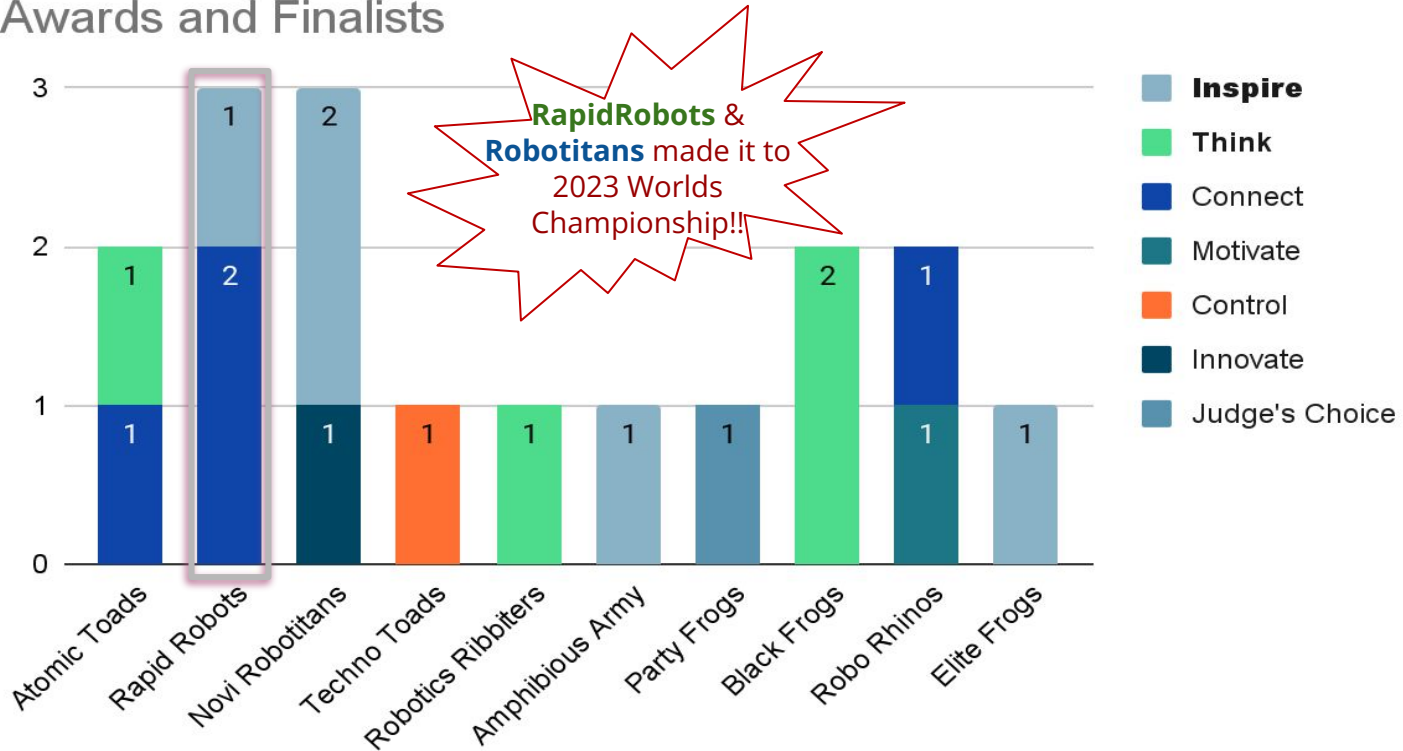


Rapid Robots

# Season 2022-23 outcome



## Awards and Finalists



# Key Highlights



## OUTREACH

**800+** Hours

**3** Plant visits *Technical*

**4** School visits

**1** OCCRA Preparatory match

**1** City Office

**4** Community Heritage Volunteering

**4** Conservation & Environment

**4** Mentoring FLL and FTC



## AUDIENCE VISIBILITY

**400+** during heritage walk

**100+** during industry expert visits

**50+** international Outreach

**250+** School seminars and events

**200+** during community Events



## MENTORS

**7** Internal

**2** Novi High School Youth Mentors

**Multiple** Industry Experts



## COOPERTITION®

Sharing parts

Help in programming

Judging Sessions

Robot build challenges

Interaction with **3** other FTC/FLL teams.

**1** team won the Inspire Award that took consultations from our mentors!

# Key Highlights



## FINANCE

Team Contribution

**\$2,388**

Sponsorship

Platinum: **\$19,444**

Gold: **\$1,000**

Silver: **\$1,050**

**Total: \$23,832**



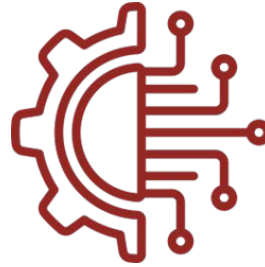
## INNOVATION

**Dual Clamp** Design

**Lateral mount** of Viper Slides

**H-Configuration** Chassis

Motors selection **optimization**



## TECHNOLOGY

TensorFlow

Artificial Intelligence

Machine Learning

Multi-Threading

Multi-Tasking



## AWARDS

Powerplay Season

Competing in **World's** championship

**MI State championship Inspire AWARD** 2nd place

**Inspire** Award Winner

**Connect** Award Winner

**Finalist Alliance** 1st Pick

**Think** Award Finalist

**Inspire** Award Finalist

**Connect** Award Finalist

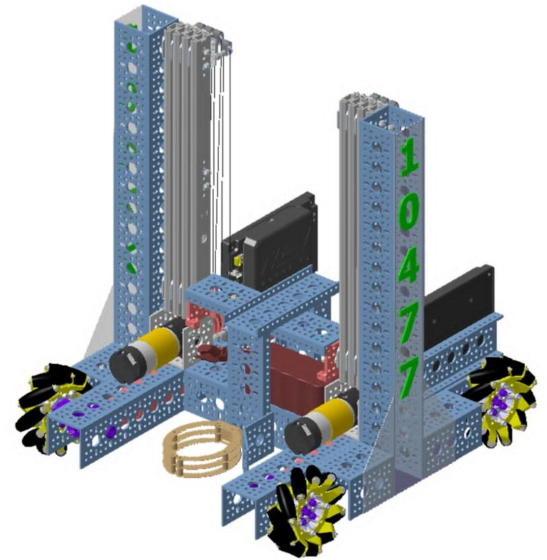
**Design** Award Finalist



# N-ergize-R Evolution

Our robot has evolved a lot throughout the season, ultimately adding up to 14 different iterations, each innovative and beneficial to the robot.

- This involves changing and prototyping new designs.
  - Ex. Going from a bulky cup shaped claw to a lighter finger-like design
- We also added supporting parts to our original design concepts to improve them.
  - Ex. We went from one vertically mounted linear slide, to using 2 to make the whole up-and-down motion faster and more stable.
- We also tested out ideas and implemented suggestions from our outreach activities.
  - Ex. Making sure the bulk of the weight was in the center; a suggestion from an outreach with a start-up company, Peer Robotics.

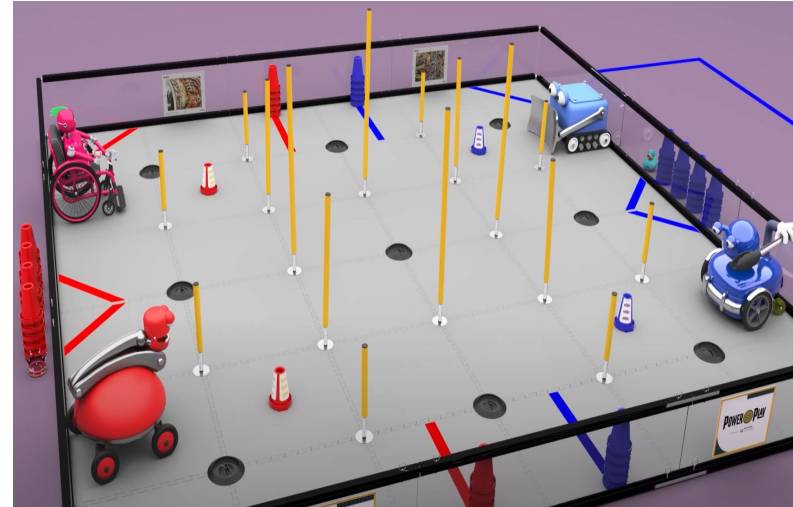


# Where Design Meets Game Play



Our robot has definitely been shaped overtime to do its best in this year's game, PowerPlay.

- Many elements of our robot have been changed to complete tasks more efficiently and precisely.
  - Ex. We programmed our controllers to have specialized buttons for various pole heights. Ex. We added a second vertically mounted linear slide to lift up the claws faster.
- We also changed elements of our robot because they interfered with tasks or didn't work that well.
  - Ex. One version of our claw was a bulky cup shaped design which interfered with the beacon. This was changed to better accommodate the beacon and other uses of the claw.
- Our overall design also includes many innovative and unique components.
  - Ex. Probably the most notable of these are the two claws mounted between our 2 slides. This greatly improved our gameplay by making it faster and easier to lift and place cones.



# PowerPlay Season Impressions

## RAPID ROBOTS #10477



Competing in the world's championship with 191 national and international teams conducted in Houston TX.



Rapid Robots – Team members



Aarush



Abirishthi



Ayansh



Debakshi



Gaurang



Ishaan K



Ishaan P



Karthikeya



Shushruth



Sohan



Veer



Vyom



### 2022-2023 Awards

**\* World's 2022-2023 \***

#### States:

1. Inspire 2<sup>nd</sup> Place
2. Connect 1<sup>st</sup> Place

#### Qualifiers:

1. Inspire winner
2. Connect winner
3. Finalist alliance 1<sup>st</sup> pick
4. Think finalist
5. Design finalist

# PowerPlay Season Impressions



# Thank You

Thank You To Our Sponsors

Thank You To Our School District

Thank You To Our Parents/Mentors/Coaches

Thank You To The City Council Members and the Mayor