

800+ 3D Printers Distributed



Our team has donated 3D printers to FIRST teams including every FTC team in SoCal and FRC teams in Belize. We break down financial barriers and offer early access to tools for innovation and discovery.

500+ 3D Printers + CAD lessons



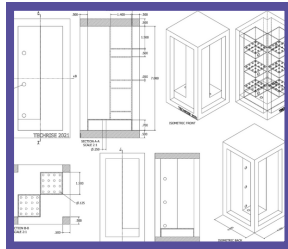
FLL Teams FTC Teams FRC Teams

300+ 3D Printers + CAD lessons

- Navajo American Indian Tribes in Arizona and New Mexico
 - Boy Scouts and Girl Scouts of the American
 - Boys and Girls Club of La Habra
- Worked with the **Department of Education** to introduce CAD to:
- Monrovia, Norco, Corona: **15 schools**
 - Los Angeles: **25 schools**
 - Orange County: **24 schools**

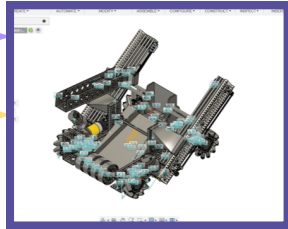
CAD Workshops

Organized **10 weeks of CAD workshops** for **FTC teams, homeschool, & special needs students** teaching marketable skills for acquiring future jobs.



Researched effects of microgravity on liquid transporting to contribute to an eco-friendly alternative and agriculture development in space; will launch on Blue Origin Rocket.

MENTOR FTC 20360



Opened our woodshop to FTC team 20360 through CAD, 3D Printing, and fabrication of their 2023-2024 robot. We taught them how to use Fusion 260 & machinery tools.

#SOCIETY OF WOMEN ENGINEERS



Recognize the potential to inspire and support women. We provide field trips, mentorship, and opportunities for girls and women to excel and innovate.

KODE4KIDS NONPROFIT



Founded program to teach 200+ students free programming courses of Java, Python, and Scratch across the U.S. and offered FRC teams an opportunity to teach courses since 2020.

BOY SCOUTS EARNING BADGES



Open doors into FIRST by organizing Boy Scout troops to volunteer at our 5 FIRST competitions hosted and help them earn STEM badges.

TEAM SPROCKET

2021-2024 OUTREACH



... A team of 61 aspiring engineers and business leaders from Diamond Bar High School with a mission to use our STEM education to make a difference and connect with fellow changemakers to build a better future. Guided by *service, inclusivity, and sustainability*, Team Sprocket sees limitless opportunities ahead for future STEAM leaders.

75% Of TS is first-gen for college
100% Of TS mentors FIRST teams
100% Of TS hosted outreaches

5K+ Total volunteer hours
38 Outreaches hosted
5 FIRST competitions hosted

#Friends of Yimbo

Since 2019, we have hosted an annual **8K Sprocket Walk-It** raising \$4000 to bring **STEAM** to **472 students** from **Muguna Primary School** in **Yimbo, Kenya**. We delivered engineering kits & introduced STEAM courses inspired by FLL innovation projects.



International Exchange Program

We have broken down language barriers and supported **FRC 7527** since 2019 by hosting **3 annual programs** with **100+ students** from **Kaohsiung Municipal Girls' & Boys' High School** from **Taiwan**, **Tsinghua High School** from **Beijing, China**, & **Xiamen University**.



RoboGhana

Every Wednesday, we mentor several **FLL Challenge & Discovery teams** from the **School of Ghana** and enhance their **EV3 course** through creating and teaching **Artificial Intelligence lessons**.



STEAM Fair

We hosted our STEAM fair featuring **FIRST teams** and **STEM clubs** from local colleges. We also invited authors to read their books for **500+ attendees** and gave each attendee free books to enhance creativity and innovation.



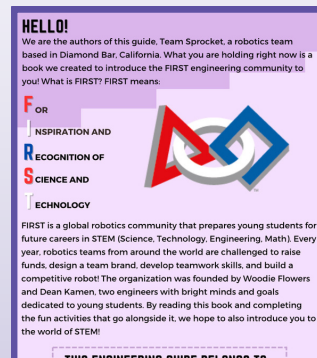
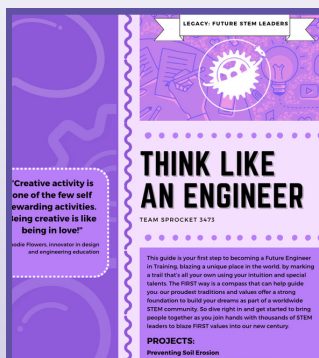
School Courses (UC APPROVED)

We created and implemented 2 STEAM courses, **Industrial Engineering Design Academy (IDEA) I & II** at **24 schools**. Our newest course, **Innovations in Technology**, explores the intersection between **business & engineering** and will be released next school year.



STEAM MAGAZINES

Our monthly published hands-on magazine captures the magic of **FIRST** through **11 FRC teams**. Our space exploration themed magazine has been published in the **Hindu In Times** and **Carnegie Mellon's outreach initiatives**.



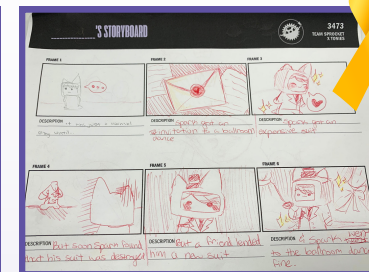
Engineering Summer Academy

During the summer, we hosted a **5-week Engineering Academy** with **150+ students** since **2018**. We introduced them to **FTC**, **graphic design**, and **artificial intelligence**.



Tonies Storytelling Workshops

We partnered with **Tonies**, a storytelling toy company that combines art and **STEM**, to provide **storytelling workshops**, teaching middle school students and **pediatric cancer patients** at **CHOCLA & Ronald McDonald** how to bring their creative stories to life through **STEAM**.



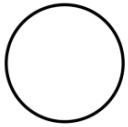
Printed Works

Through our student-run business, we maintain **sustainability** by earning **20k annually** creating customized banners and T-shirts for our city. We have also donated customized T-shirts, event banners, and competition signs for **FIRST competitions** and teams.



COLOR PALETTE

PRIMARY



WHITE
HEX: #ffffff
RGB: 255, 255, 255
CMYK: 0, 0, 0, 0



BLACK
HEX: #000000
RGB: 0, 0, 0
CMYK: 0, 0, 0, 100



PURPLE
HEX: #5f52a3
RGB: 95, 82, 163
CMYK: 74, 78, 0, 0

SECONDARY



GRAY
HEX: #a6a6a6
RGB: 166, 166, 166
CMYK: 0, 0, 0, 35



LIGHT PURPLE
HEX: #b4a7d6
RGB: 180, 167, 214
CMYK: 28, 23, 0, 0



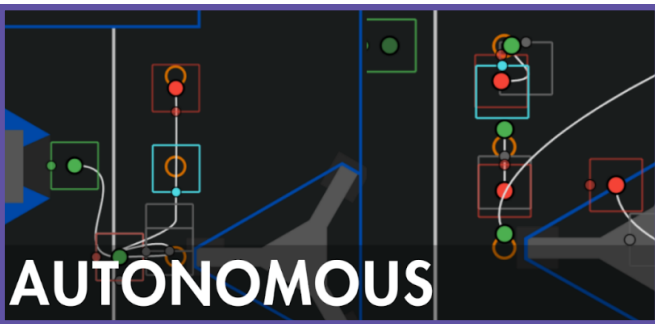
NAVY BLUE
HEX: #253569
RGB: 37, 53, 105
CMYK: 65, 50, 0, 59



TEAL
HEX: #14baba
RGB: 20, 186, 186
CMYK: 89, 0, 0, 27



LIGHT GOLD
HEX: #ffdc73
RGB: 255, 220, 115
CMYK: 0, 14, 55, 0



AUTON

- Trajectory following
 - Pathplanner for Auton
 - Splines reduces sharp changes in velocity
 - A feedforward pure pursuit controller and PID allow for accurate trajectory tracking
- Localization
 - AprilTag with Limelight 3 to localize robot location
 - The volatility (total deviation from the average) is calculated to update odometry

ROBOT GOALS:

- Fit under the stage core (27.5")
- Score in Amp, Trap, Speaker, and climb
- Swerve Drive for maximum maneuverability

QUALIFICATIONS

- Score from the speaker, but scoring in the amp is necessary for the amplification bonus
- Pick up the notes from the ground
 - Faster cycle times.
 - Eliminates the need to line up with the source.
 - Allows us to pick up starting notes.
- Shoot from the podium and protected wing zone



TELE-OP

- Superstructure
 - State machine is used to generate setpoints for superstructure elements, and superstructure states switch automatically to reduce work for drivers
 - Trapezoidal profiled state transitioners are used to reach setpoints
- Driving
 - Field oriented Swerve Drives using Talon encoders and gyro
 - Inverse is kinematics used to calculate individual module positions
 - PID to prevent rotational drift

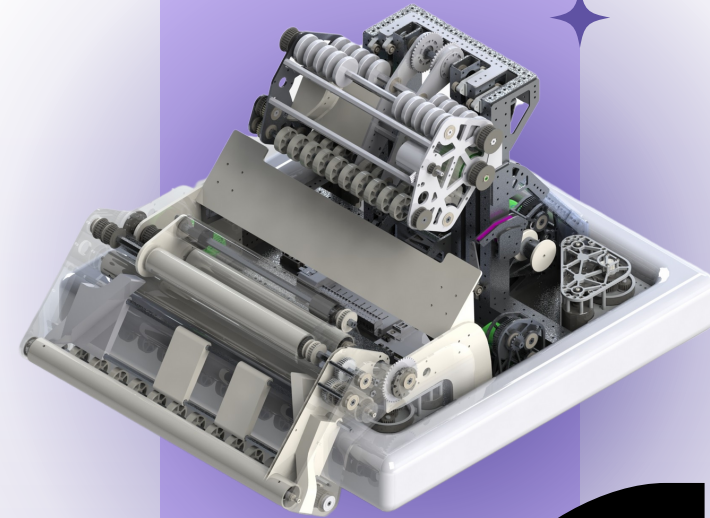
SPEAKER SCORING

- Vision/Odometry localization and gyro used to auto-align with speaker
- Wrist and shooter angle calculated with distance and drag-based trajectory formula



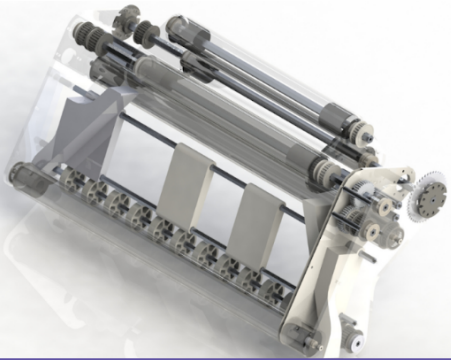
TEAM SPROCKET

2023-2024 ROBOT



**BLASTING OFF INTO
THE SEASON WITH
OUR ROBOT: *ENDEAVOR*!**

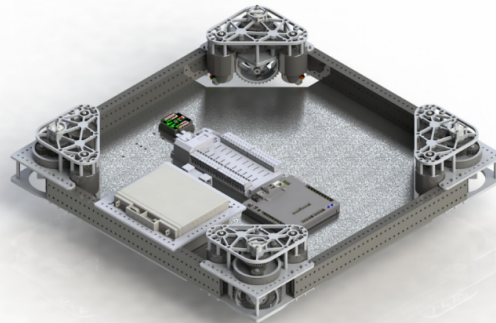
INTAKE



INTAKE

- 27" wide intake
 - Touch-and-go allows for greater driver tolerance
- 2" dead axle polycarb rollers, 2" compliant
 - Light and durable
 - Grip tape to make sure notes stick to rollers
 - Custom intake pivot gearbox (36:1 gear reduction)

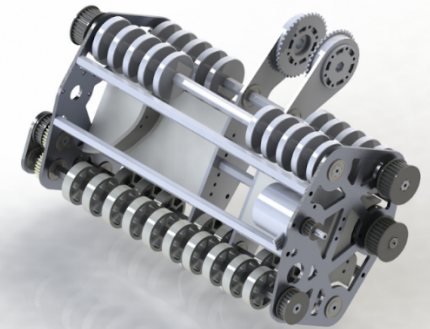
DRIVEBASE



DRIVEBASE

- SDS MK4i L2 Modules with Krakens
- Chassis
 - 28" x 28" Frame
 - Low CG with a full bellypan
- Electrical Board
 - REV Power Distribution Board
 - Battery stored at the front, allowing the robot to tip forward on the climb

SHOOTER

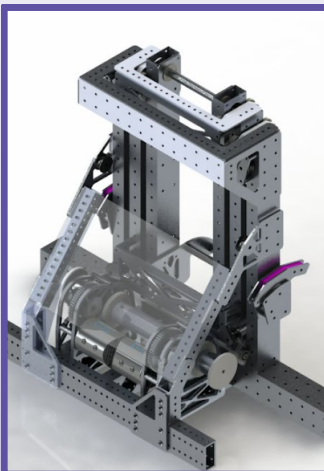


SHOOTER

- Vertical wheeled roller shooter
- 2 3/8" orange banebot wheel
 - Grippy, light, consistent compression
 - Rings are soft, so we need harder wheels to have consistent compression
- 3D-printed guides compress the rings from the side
- Shooter pivot gearbox, 2.7:1 gear reduction, custom gearbox
- 2" compliant wheels hold note

ELEVATOR

- 3-stage cascade elevator
- Driven by a 19:1 ratio gearbox
- Driven by two kraken motors
- Each stage is held in place by bearing blocks
- All other structural components are made on a CNC mill



SCOUTING APP

- Platform designed for scouting team to collect match data
- Written with javascript, typescript, HTML, and CSS
- Data analyzed to optimize alliance selection

SPROCKET STATS

Sprocket Stats is a comprehensive, customizable, cross-platform scouting application for the FIRST Robotics Competition. Through collecting and analyzing robot performance data, this application assists your team in making informed strategic decisions.

Pre-Match

Team Number

Enter Here

Match Type

Practice Qualification Playoff

Match Number

Enter Here

Alliance Color

Red Blue

GOAL

SAFETY FIRST

Safety is the foundation upon which **innovation** and **teamwork** are built. Our robot is an integration of electrical, mechanical, and software components, each posing unique hazards. Prioritizing safety ensures that members are protected from these risks, fostering an environment where creativity and learning can flourish without the fear of accidents.

"SAFETY IN INNOVATION IS NOT JUST ABOUT PREVENTING ACCIDENTS; IT'S ABOUT FOSTERING AN ENVIRONMENT WHERE YOUNG MINDS CAN EXPERIMENT, LEARN, AND GROW WITH THE CONFIDENCE THAT THEIR WELL-BEING IS ALWAYS THE *FIRST* PRIORITY."

ABOUT US



We are a team of 61 members that places safety at the forefront of our STEM endeavors and connecting with fellow changemakers. This shared value of safety propels us beyond following protocols; it fosters innovation as we constantly seek smarter, safer ways to achieve our goals.



TEAM SPROCKET

2023-2024 Safety Brochure



MACHINERY

- Never use any machinery that you have not been properly trained in
- Unsure if you've been properly trained? If you're not sure, you're not properly trained. You must pass the safety exam and have a buddy with you in order to operate machinery.
- ALL members need to pass the safety tests in order to operate the machinery
- Turn off unattended machinery
- Always unplug the machinery after use
- Assume all machinery is on
- Make sure machinery is operating at the right speed
- Announce you are cutting before you cut
- Make sure all wires are away from the machinery before operating

GENERAL RULES

- Tools and equipment **MUST** be put back where they belong.
- The shop **MUST** be cleaned during the last 30 minutes of the meeting
- No open food inside the shop
- Do not toss around equipment or game elements
- Clean up after yourself
- Always work on the tables, never work on the ground
- Put all tools back where they belong
- Don't clog the walkways

**UPON ENTERING THE
WOODSHOP, LOCATE
THE NEAREST:**



PIT GUIDELINES

- Safety glasses must be on in the pits, practice field, and competition field
- Don't run in the pits
- Announce when you are using machinery to warn others
- Don't block the pit paths
- Warn others before enabling the robot
- Always be aware of your surroundings
- Warn others when you are transporting the robot

ATTIRE

- **ALWAYS** wear safety glasses
- Closed-toe shoes
- NO loose hair, dangling jewelry, or loose articles of clothing
- NO AirPods, earbuds, or headphones
- Protective ear wear may be worn when operating loud machinery